1995

PRODUCT SELECTION GUIDE

HARRIS

PSG
201.22

A Short-Form Reference to Harris Semiconductor Products

PRODUCT SELECTION GUIDE

JULY 1995

HARRIS
SEMICONDUCTOR

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HARRIS SEMICONDUCTOR

PRODUCT SELECTION GUIDE

This Product Selection Guide represents the full line of Harris Semiconductor products. The guide is divided into 12 sections as listed in the Table of Contents (page iii).

There are two ways to search for products in this selection guide. Section 1 is an alphanumeric index to be used when the complete part number is known. If only the product function is known, use the Device Category Listing (page ii) to identify which section to reference.

Only key specifications are listed in this selection guide. For complete details order the datasheet by using Harris AnswerFAX (see Section 11) or through Sector Applications (page iv). When using Harris AnswerFAX, the file number is used as the AnswerFAX document number.

Literature requests can be directed to:

Harris Semiconductor Data Services
P.O. Box 883, MS 53-204
Melbourne, FL 32902
Phone: 1-800-442-7747
Fax: 407-724-7240

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HARRIS SEMICONDUCTOR
ANSWER FAX℠

HARRIS CORPORATION 100 YEARS HARRIS 1895-1995

See our specs in CAPS

See Section 11 for Datasheets Available on AnswerFAX
(407) 724-7800

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Printed in USA, 7/1995

DEVICE CATEGORY LISTING

DEVICE CATEGORY	SECTION NAME	SECTION NUMBER
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Sample and Hold Amplifiers	Linear	2
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Switches, Analog	Data Acquisition	3
Telecommunications Circuits	Telecom	5

Harris Semiconductor products are sold by description only. All specifications in this product guide are applicable only to packaged products; specifications for die are available upon request. Harris reserves the right to make changes in circuit design, specifications and other information at any time without prior notice. Accordingly, the reader is cautioned to verify that information in this publication is current before placing orders. Reference to products of other manufacturers are solely for convenience of comparison and do not imply total equivalency of design, performance, or otherwise.

HARRIS SEMICONDUCTOR

PRODUCT SELECTION GUIDE

FOR COMMERCIAL, INDUSTRIAL, AND MILITARY APPLICATIONS

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TECHNICAL ASSISTANCE

For technical assistance on Harris products listed in this product selection guide, the Field Applications Engineers are available at one of the following Harris Sales Offices:

UNITED STATES		
CALIFORNIA	Calabasas	818-878-7955
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HARRIS SEMICONDUCTOR

ANSWER FAX℠

Harris' AnswerFAX Number is 407-724-7800

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DB303	Microprocessors Products
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DB309	MCT/IGBTs/Diodes
DB312	Analog Military Supplement

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DB314	Signal Processing New Releases
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DB500	Linear and Telecom
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CD4034B/3A	9-71, 11-22	DB235	7012
CD4034BKMSH	9-71	DB235	3307
CD4034BKMSR	9-71	DB235	3307
CD4035B	8-53, 8-81, 8-98, 8-111, 9-33, 11-22	SG103	1101
CD4035BD3	9-71, 11-22	SG103	7012
CD4035BDMSH	9-71	-	3308
CD4035BDMSR	9-71	-	3308
CD4035B/3A	9-71, 11-22	SG103	7012
CD4035BFMSH	9-71	-	3308
CD4035BFMSR	9-71	-	3308
CD4035BK3	9-71, 11-22	SG103	7012
CD4035BKMSH	9-71	-	3308
CD4035BKMSR	9-71	-	3308
CD4040A	8-81	SG103	1063
CD4040AD3	9-71, 11-22	SG103	7012
CD4040AK3	9-71, 11-22	SG103	7012
CD4040BD3	9-71, 11-22	SG103	7012
CD4040BDMSH	9-71	DB235	3300
CD4040BDMSR	9-71	DB235	3300
CD4040B/3A	9-71, 11-22	SG103	7012
CD4040BFMSH	9-71	DB235	3300
CD4040BFMSR	9-71	DB235	3300
CD4040BKMSH	9-71	DB235	3300
CD4040BKMSR	9-71	DB235	3300
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CD4041AD3	9-72, 11-22	SG103	7012
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CD4041UBDMSH	9-72	DB235	3309
CD4041UBDMSR	9-72	DB235	3309
CD4041UB/3A	9-72, 11-22	SG103	7012
CD4041UBFBR	9-72	-	-
CD4041UBFMSH	9-72	DB235	3309
CD4041UBFMSR	9-72	DB235	3309
CD4041UBFMSR	9-72	DB235	3309
CD4041UBFSR	9-72	-	-
CD4041UBK3	9-72, 11-22	SG103	7012
CD4041UBKMSH	9-72	DB235	3309
CD4041UBKMSR	9-72	DB235	3309
CD4041UBKMSR	9-72	DB235	3309
CD4041UBQBR	9-72	-	-

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DB220	Bipolar Power
DB223	Power MOSFETs
DB235	Rad Hard/Hi Rel
DB260	CDP6805 & Peripheral
DB301	Data Acquisition

DATA BOOK #	DATA BOOK TITLE
DB302	Digital Signal Processing
DB303	Microprocessors Products
DB304	Intelligent Power
DB309	MCT/IGBTs/Diodes
DB312	Analog Military Supplement

DATA BOOK #	DATA BOOK TITLE
DB314	Signal Processing New Releases
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CD4041UBQSR	9-72	-	-
CD4042A	8-81	SG103	589
CD4042AD3	9-72, 11-22	SG103	7012
CD4042B	8-54, 8-81, 8-98, 8-111, 9-33, 11-22	SG103	954
CD4042BDMSH	9-72	DB235	3310
CD4042BDMSR	9-72	DB235	3310
CD4042B/3A	9-72, 11-22	SG103	7012
CD4042BFMSH	9-72	DB235	3310
CD4042BFMSR	9-72	DB235	3310
CD4042BK3	9-72, 11-22	SG103	7012
CD4042BKMSH	9-72	DB235	3310
CD4042BKMSR	9-72	DB235	3310
CD4043A	8-81	SG103	590
CD4043B	8-54, 8-82, 8-98, 8-111, 9-33, 11-22	SG103	956
CD4043BDMSH	9-72	DB235	3311
CD4043BDMSR	9-72	DB235	3311
CD4043B/3A	9-72, 11-22	SG103	7012
CD4043BFMSH	9-72	DB235	3311
CD4043BFMSR	9-72	DB235	3311
CD4043BKMSH	9-72	DB235	3311
CD4043BKMSR	9-72	DB235	3311
CD4044A	8-82	SG103	590
CD4044B	8-54, 8-82, 8-98, 8-111, 9-33, 11-22	SG103	956
CD4044BD3	9-72, 11-22	SG103	7012
CD4044BDMSH	9-72	DB235	3311
CD4044BDMSR	9-72	DB235	3311
CD4044B/3A	9-72, 11-22	SG103	7012
CD4044BFMSH	9-72	DB235	3311
CD4044BFMSR	9-72	DB235	3311
CD4044BKMSH	9-72	DB235	3311
CD4044BKMSR	9-72	DB235	3311
CD4045B	8-54, 8-111, 11-22	SG103	1119
CD4046A	8-82	SG103	637
CD4046AD3	9-72, 11-22	SG103	7012
CD4046B	8-54, 8-82, 8-89, 8-98, 8-111, 9-33, 11-22	SG103	1099
CD4046BD3	9-72, 11-22	SG103	7012
CD4046BDMSH	9-72	DB235	3312
CD4046BDMSR	9-72	DB235	3312
CD4046B/3A	9-72, 11-22	DB235	7012
CD4046BFMSH	9-72	DB235	3312
CD4046BFMSR	9-72	DB235	3312
CD4046BK3	9-72, 11-22	SG103	7012
CD4046BKMSH	9-72	DB235	3312
CD4046BKMSR	9-73	DB235	3312
CD4047B	8-54, 8-82, 8-98, 8-111, 9-33, 11-22	SG103	1123
CD4047BD3	9-73, 11-22	SG103	7012
CD4047BDMSH	9-73	DB235	3313
CD4047BDMSR	9-73	DB235	3313
CD4047B/3A	9-73, 11-22	SG103	7012
CD4047BFMSH	9-73	DB235	3313
CD4047BFMSR	9-73	DB235	3313
CD4047BKMSH	9-73	DB235	3313
CD4047BKMSR	9-73	DB235	3313
CD4048A	8-82	SG103	636
CD4048AD3	9-73, 11-22	SG103	7012
CD4048B	8-54, 8-82, 8-98, 8-111, 9-33, 11-22	SG103	1124
CD4048BD3	9-73, 11-22	SG103	7012
CD4048BDMSH	9-73	DB235	3314
CD4048BDMSR	9-73	DB235	3314
CD4048B/3A	9-73, 11-22	SG103	7012
CD4048BFMSH	9-73	DB235	3314
CD4048BFMSR	9-73	DB235	3314
CD4048BKMSH	9-73	DB235	3314
CD4048BKMSR	9-73	DB235	3314
CD4049A	8-82	SG103	599
CD4049AD3	9-73, 11-22	SG103	7012
CD4049AFB	9-73	-	-
CD4049UB	8-54, 8-82, 8-89, 8-98, 8-111, 9-33, 11-22	SG103	926
CD4049UBD3	9-73, 11-22	SG103	7012
CD4049UBDMSH	9-73	DB235	3315
CD4049UBDMSR	9-73	DB235	3315
CD4049UB/3A	9-73, 11-22	SG103	7012
CD4049UBFB	9-73	-	-
CD4049UBFBH	9-73	-	-
CD4049UBFBR	9-73	-	-
CD4049UBFMSH	9-73	DB235	3315
CD4049UBFMSR	9-73	DB235	3315
CD4049UBFSH	9-73	-	-
CD4049UBFSR	9-73	-	-
CD4049UBK3	9-73, 11-22	SG103	7012
CD4049UBKMSH	9-73	DB235	3315
CD4049UBKMSR	9-73	DB235	3315
CD4049UBQBH	9-73	-	-
CD4049UBQBR	9-73	-	-
CD4049UBQSH	9-73	-	-
CD4049UBQSR	9-73	-	-
CD4050A	8-82	SG103	599
CD4050AFB	9-73		-
CD4050B	8-54, 8-82, 8-89, 8-98, 8-111, 9-33, 11-22	SG103	926
CD4050BD3	9-73, 11-22	SG103	7012
CD4050BDMSH	9-73	DB235	3193
CD4050BDMSR	9-73	DB235	3193
CD4050B/3A	9-73, 11-22	SG103	7012
CD4050BFB	9-73	-	-
CD4050BFBH	9-74	-	-
CD4050BFBR	9-74	-	-
CD4050BFMSH	9-74	DB235	3193
CD4050BFMSR	9-74	DB235	3193
CD4050BFSH	9-74	-	-

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CD4050BFSR	9-74	-	-
CD4050BK3	9-74, 11-22	SG103	7012
CD4050BKMSH	9-74	DB235	3193
CD4050BKMSR	9-74	DB235	3193
CD4050BQBH	9-74	-	-
CD4050BQBR	9-74	-	-
CD4050BQSH	9-74	-	-
CD4050BQSR	9-74	-	-
CD4051B	8-54, 8-82, 8-90, 8-98, 8-111, 9-33, 11-22	SG103	902
CD4051BD3	9-74, 11-22	SG103	7012
CD4051BDMSH	9-74	DB235	3316
CD4051BDMSR	9-74	DB235	3316
CD4051B/3A	9-74, 11-22	SG103	7012
CD4051BFMSH	9-74	DB235	3316
CD4051BFMSR	9-74	DB235	3316
CD4051BK3	9-74, 11-22	SG103	7012
CD4051BKMSH	9-74	DB235	3316
CD4051BKMSR	9-74	DB235	3316
CD4052B	8-54, 8-82, 8-90, 8-98, 8-111, 9-33, 11-22	SG103	902
CD4052BDMSH	9-74	DB235	3316
CD4052BDMSR	9-74	DB235	3316
CD4052B/3A	9-74, 11-22	SG103	7012
CD4052BFMSH	9-74	DB235	3316
CD4052BFMSR	9-74	DB235	3316
CD4052BKMSH	9-74	DB235	3316
CD4052BKMSR	9-74	DB235	3316
CD4053B	8-54, 8-82, 8-90, 8-98, 8-112, 9-33, 11-22	SG103	902
CD4053BD3	9-74, 11-22	SG103	7012
CD4053BDMSH	9-74	DB235	3316
CD4053BDMSR	9-74	DB235	3316
CD4053B/3A	9-74, 11-22	SG103	7012
CD4053BFMSH	9-74	DB235	3316
CD4053BFMSR	9-74	DB235	3316
CD4053BKMSH	9-74	DB235	3316
CD4053BKMSR	9-74	DB235	3316
CD4054B	8-54, 8-82, 8-90, 8-98, 8-112, 11-22	SG103	634
CD4054B/3A	9-74, 11-22	SG103	7012
CD4055B	8-54, 8-112, 11-22	SG103	7012
CD4056B	8-54, 8-82, 8-90, 8-98, 8-112, 11-22	SG103	634
CD4056B/3A	9-74, 11-22	SG103	7012
CD4059A	8-54, 8-82, 8-112, 11-22	SG103	898
CD4059AD3	9-74, 11-22	SG103	7012

PART NUMBER	PSG PAGE NUMBER	DATA BOOK	FILE #
CD4060A	8-82, 11-23	SG103	1120
CD4060AD3	9-74, 11-22	SG103	7012
CD4060B	8-54, 8-82, 8-99, 8-112, 9-33, 11-23	SG103	1120
CD4060BDMSH	9-74	DB235	3317
CD4060BDMSR	9-74	DB235	3317
CD4060B/3A	9-74, 11-22	SG103	7012
CD4060BFMSH	9-74	DB235	3317
CD4060BFMSR	9-74	DB235	3317
CD4060BKMSH	9-74	DB235	3317
CD4060BKMSR	9-74	DB235	3317
CD4063B	8-54, 8-82, 8-99, 8-112, 9-33, 11-23	SG103	805
CD4063BD3	9-74, 11-22	SG103	7012
CD4063BDMSH	9-75	DB235	3318
CD4063BDMSR	9-75	DB235	3318
CD4063B/3A	9-75, 11-22	SG103	7012
CD4063BFMSH	9-75	DB235	3318
CD4063BFMSR	9-75	DB235	3318
CD4063BKMSH	9-75	DB235	3318
CD4063BKMSR	9-75	DB235	3318
CD4066AD3	9-75, 11-22	SG103	7012
CD4066B	8-54, 8-82, 8-91, 8-99, 8-112, 9-33, 11-23	-	1114
CD4066BD3	9-75, 11-22	SG103	7012
CD4066BDMSH	9-75	DB235	3319
CD4066BDMSR	9-75	DB235	3319
CD4066B/3A	9-75, 11-22	SG103	7012
CD4066BFB	9-75	-	-
CD4066BFBH	9-75	-	-
CD4066BFBR	9-75	-	-
CD4066BFMSH	9-75	DB235	3319
CD4066BFMSR	9-75	DB235	3319
CD4066BFSH	9-75	-	-
CD4066BFSR	9-75	-	-
CD4066BK3	9-75, 11-22	SG103	7012
CD4066BKMSH	9-75	DB235	3319
CD4066BKMSR	9-75	DB235	3319
CD4066BQBH	9-75	-	-
CD4066BQBR	9-75	-	-
CD4066BQSH	9-75	-	-
CD4066BQSR	9-75	-	-
CD4067B	8-54, 8-82, 8-90, 8-99, 8-112, 9-33, 11-23	SG103	3719
CD4067BDMSH	9-75	DB235	3190
CD4067BDMSR	9-75	DB235	3190
CD4067B/3A	9-75, 11-22	SG103	7012
CD4067BFMSR	9-75	DB235	3190

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DATA BOOK #	DATA BOOK TITLE
DB220	Bipolar Power
DB223	Power MOSFETs
DB235	Rad Hard/Hi Rel
DB260	CDP6805 & Peripheral
DB301	Data Acquisition

DATA BOOK #	DATA BOOK TITLE
DB302	Digital Signal Processing
DB303	Microprocessors Products
DB304	Intelligent Power
DB309	MCT/IGBTs/Diodes
DB312	Analog Military Supplement

DATA BOOK #	DATA BOOK TITLE
DB314	Signal Processing New Releases
DB450	Transient Voltage Suppression
DB500	Linear and Telecom
'89 Ana Mil	1989 Analog Military
SG103	CMOS Logic Selection Guide

Products listed in Section 11 are available through AnswerFAX.

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CD4067BKMSH	9-75	DB235	3190
CD4067BKMSR	9-75	DB235	3190
CD4068B	8-54, 8-83, 8-99, 8-112, 9-33, 11-23	SG103	809
CD4068BD3	9-75, 11-22	SG103	7012
CD4068BDMSH	9-75	DB235	3320
CD4068BDMSR	9-75	DB235	3320
CD4068B/3A	9-75, 11-22	SG103	7012
CD4068BFMSH	9-75	DB235	3320
CD4068BFMSR	9-75	DB235	3320
CD4068BKMSH	9-75	DB235	3320
CD4068BKMSR	9-75	DB235	3320
CD4069UB	8-54, 8-83, 8-99, 8-112, 9-33, 11-23	SG103	804
CD4069UBDMSH	9-75	DB235	3321
CD4069UBDMSR	9-75	DB235	3321
CD4069UB/3A	9-75, 11-22	SG103	7012
CD4069UBFB	9-75	-	-
CD4069UBFBH	9-75	-	-
CD4069UBFBR	9-75	-	-
CD4069UBFMSH	9-75	DB235	3321
CD4069UBFMSR	9-75	DB235	3321
CD4069UBFSH	9-75	-	-
CD4069UBFSR	9-75	-	-
CD4069UBKMSH	9-76	DB235	3321
CD4069UBKMSR	9-76	DB235	3321
CD4069UBQBH	9-76	-	-
CD4069UBQBR	9-76	-	-
CD4069UBQSH	9-76	-	-
CD4069UBQSR	9-76	-	-
CD4070B	8-54, 8-83, 8-99, 8-112, 9-33, 11-23	SG103	910
CD4070BDMSH	9-76	DB235	3322
CD4070BDMSR	9-76	DB235	3322
CD4070B/3A	9-76, 11-22	SG103	7012
CD4070BFB	9-76	-	-
CD4070BFBH	9-76	-	-
CD4070BFBR	9-76	-	-
CD4070BFMSH	9-76	DB235	3322
CD4070BFMSR	9-76	DB235	3322
CD4070BFSH	9-76	-	-
CD4070BFSR	9-76	-	-
CD4070BKMSH	9-76	DB235	3322
CD4070BKMSR	9-76	DB235	3322
CD4070BQBH	9-76	-	-
CD4070BQBR	9-76	-	-
CD4070BQSH	9-76	-	-
CD4070BQSR	9-76	-	-
CD4071B	8-54, 8-83, 8-99, 8-112, 9-33, 11-23	SG103	807
CD4071BD3	9-76, 11-22	SG103	7012
CD4071BDMSH	9-76	DB235	3323
CD4071BDMSR	9-76	DB235	3323

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CD4071B/3A	9-76, 11-22	SG103	7012
CD4071BFB	9-76	-	-
CD4071BFBH	9-76	-	-
CD4071BFBR	9-76	-	-
CD4071BFMSH	9-76	DB235	3323
CD4071BFMSR	9-76	DB235	3323
CD4071BFSH	9-76	-	-
CD4071BFSR	9-76	-	-
CD4071BK3	9-76, 11-22	SG103	7012
CD4071BKMSH	9-76	DB235	3323
CD4071BKMSR	9-76	DB235	3323
CD4071BQBH	9-76	-	-
CD4071BQBR	9-76	-	-
CD4071BQSH	9-76	-	-
CD4071BQSR	9-76	-	-
CD4072B	8-54, 8-83, 8-99, 8-112, 9-33, 11-23	SG103	807
CD4072BD3	9-76, 11-22	SG103	7012
CD4072BDMSH	9-76	DB235	3323
CD4072BDMSR	9-76	DB235	3323
CD4072B/3A	9-76, 11-22	SG103	7012
CD4072BFBR	9-76	-	-
CD4072BFMSH	9-76	DB235	3323
CD4072BFMSR	9-76	DB235	3323
CD4072BKMSH	9-76	DB235	3323
CD4072BKMSR	9-76	DB235	3323
CD4072BQBR	9-76	-	-
CD4073B	8-54, 8-83, 8-99, 8-112, 9-33, 11-23	SG103	806
CD4073BDMSH	9-77	DB235	3324
CD4073BDMSR	9-77	DB235	3324
CD4073B/3A	9-77, 11-22	SG103	7012
CD4073BFB	9-77	-	-
CD4073BFBR	9-77	-	-
CD4073BFMSH	9-77	DB235	3324
CD4073BFMSR	9-77	DB235	3324
CD4073BKMSH	9-77	DB235	3324
CD4073BKMSR	9-77	DB235	3324
CD4073BQBR	9-77	-	-
CD4075B	8-54, 8-83, 8-99, 8-112, 9-33, 11-23	SG103	807
CD4075BD3	9-77, 11-22	SG103	7012
CD4075BDMSH	9-77	DB235	3323
CD4075BDMSR	9-77	DB235	3323
CD4075B/3A	9-77, 11-22	SG103	7012
CD4075BFB	9-77	-	-
CD4075BFBH	9-77	-	-
CD4075BFBR	9-77	-	-
CD4075BFMSH	9-77	DB235	3323
CD4075BFMSR	9-77	DB235	3323
CD4075BFSH	9-77	-	-
CD4075BFSR	9-77	-	-
CD4075BK3	9-77, 11-22	-	7012

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CD4075BKMSH	9-77	DB235	3323
CD4075BKMSR	9-77	DB235	3323
CD4075BQBH	9-77	-	-
CD4075BQBR	9-77	-	-
CD4075BQSH	9-77	-	-
CD4075BQSR	9-77	-	-
CD4076B	8-54, 8-83, 8-99, 8-112, 9-33, 11-23	SG103	903
CD4076BDMSH	9-77	DB235	3325
CD4076BDMSR	9-77	DB235	3325
CD4076B/3A	9-77, 11-22	SG103	7012
CD4076BFMSH	9-77	DB235	3325
CD4076BFMSR	9-77	DB235	3325
CD4076BKMSH	9-77	DB235	3325
CD4076BKMSR	9-77	DB235	3325
CD4077B	8-54, 8-83, 8-99, 8-112, 9-33, 11-23	SG103	910
CD4077BDMSH	9-77	DB235	3322
CD4077BDMSR	9-77	DB235	3322
CD4077B/3A	9-77, 11-22	SG103	7012
CD4077BFBR	9-77	-	-
CD4077BFMSH	9-77	DB235	3322
CD4077BFMSR	9-77	DB235	3322
CD4077BKMSH	9-77	DB235	3322
CD4077BKMSR	9-77	DB235	3322
CD4077BQBR	9-77	-	-
CD4078B	8-54, 8-83, 8-99, 8-112, 9-33, 11-23	SG103	810
CD4078BDMSH	9-77	DB235	3326
CD4078BDMSR	9-77	DB235	3326
CD4078B/3A	9-77, 11-22	SG103	7012
CD4078BFMSH	9-77	DB235	3326
CD4078BFMSR	9-77	DB235	3326
CD4078BKMSH	9-77	DB235	3326
CD4078BKMSR	9-78	DB235	3326
CD4081B	8-54, 8-83, 8-99, 8-112, 9-33, 11-23	SG103	806
CD4081BD3	9-78, 11-22	SG103	7012
CD4081BDMSH	9-78	DB235	3324
CD4081BDMSR	9-78	DB235	3324
CD4081B/3A	9-78, 11-22	SG103	7012
CD4081BFB	9-78	-	-
CD4081BFBH	9-78	-	-
CD4081BFBR	9-78	-	-
CD4081BFMSH	9-78	DB235	3324
CD4081BFMSR	9-78	DB235	3324
CD4081BFSH	9-78	-	-
CD4081BFSR	9-78	-	-

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CD4081BK3	9-78, 11-22	SG103	7012
CD4081BKMSH	9-78	DB235	3324
CD4081BKMSR	9-78	DB235	3324
CD4081BQBH	9-78	-	-
CD4081BQBR	9-78	-	-
CD4081BQSH	9-78	-	-
CD4081BQSR	9-78	-	-
CD4082B	8-54, 8-83, 8-99, 8-112, 9-33, 11-23	SG103	806
CD4082BDMSH	9-78	DB235	3324
CD4082BDMSR	9-78	DB235	3324
CD4082B/3A	9-78, 11-22	SG103	7012
CD4082BFB	9-78	-	-
CD4082BFBR	9-78	-	-
CD4082BFMSH	9-78	DB235	3324
CD4082BFMSR	9-78	DB235	3324
CD4082BKMSH	9-78	DB235	3324
CD4082BKMSR	9-78	DB235	3324
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CD4085BFSH	9-78	-	-
CD4085BFSR	9-78	-	-
CD4085BKMSH	9-78	DB235	3327
CD4085BKMSR	9-78	DB235	3327
CD4085BQBH	9-78	-	-
CD4085BQBR	9-78	-	-
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DB302	Digital Signal Processing
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DB235	Rad Hard/Hi Rel
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DB301	Data Acquisition

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DB303	Microprocessors Products
DB304	Intelligent Power
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DB312	Analog Military Supplement

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DB314	Signal Processing New Releases
DB450	Transient Voltage Suppression
DB500	Linear and Telecom
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DB223	Power MOSFETs
DB235	Rad Hard/Hi Rel
DB260	CDP6805 & Peripheral
DB301	Data Acquisition

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DB302	Digital Signal Processing
DB303	Microprocessors Products
DB304	Intelligent Power
DB309	MCT/IGBTs/Diodes
DB312	Analog Military Supplement

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DB314	Signal Processing New Releases
DB450	Transient Voltage Suppression
DB500	Linear and Telecom
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SG103	CMOS Logic Selection Guide

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V390RA22	7-64, 11-39	DB450C	2191
V390RA8	7-64, 7-73, 11-39	DB450C	2191
V390ZA05	7-64, 7-72, 11-39	DB450C	2184
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V421DA40	7-67, 7-80, 11-39	DB450C	2189
V421DB40	7-67, 7-80, 11-39	DB450C	2189
V421HA32	7-67, 7-81, 11-39	DB450C	2973
V421HA40	7-67, 7-81, 11-39	DB450C	2973
V421NA34	7-67, 7-82, 11-39	DB450C	2825
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V430MA3A	7-62, 7-78, 11-39	DB450C	2191
V430MA7B	7-62, 7-78, 11-39	DB450C	2191
V430RA16	7-64, 11-39	DB450C	2193
V430RA22	7-64, 11-39	DB450C	2193
V430RA8	7-64, 7-73, 11-39	DB450C	2193
V430ZA05	7-64, 7-72, 11-39	DB450C	2184
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V47MA2B	7-61, 7-77, 11-39	DB450C	2191
V47MA2S	7-61, 7-77, 11-39	DB450C	2191
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V47ZA3	7-63, 7-71, 7-95, 9-20, 11-39	DB450C	2184
V47ZA7	7-71, 7-95, 9-20, 11-39	DB450C	2184
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V480LA40A	7-64, 7-75, 7-98, 9-23, 11-39	DB450C	2190
V480LA7	7-64, 7-75, 11-39	DB450C	2190
V480LA80B	7-64, 7-75, 7-98, 9-23, 11-39	DB450C	2190
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V481CA32	7-67, 7-80, 11-39	DB450C	2187
V481CA40	7-67, 7-80, 11-39	DB450C	2187
V481CA60	7-67, 7-80, 11-39	DB450C	2187
V481DA40	7-67, 7-81, 11-39	DB450C	2189
V481DB40	7-67, 7-81, 11-39	DB450C	2189
V481HA32	7-67, 7-81, 11-39	DB450C	2973
V481HA40	7-67, 7-81, 11-39	DB450C	2973
V481NA34	7-67, 7-82, 11-39	DB450C	2825
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V510LA40A	7-64, 7-75, 7-98, 9-23, 11-39	DB450C	2190
V510LA80B	7-64, 7-75, 7-98, 9-23, 11-39	DB450C	2190
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V510LTX80B	7-98, 9-23, 9-128, 11-48	DB450C	7062
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DB304	Intelligent Power
DB309	MCT/IGBTs/Diodes
DB312	Analog Military Supplement

DATA BOOK #	DATA BOOK TITLE
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DB500	Linear and Telecom
'89 Ana Mil	1989 Analog Military
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New High Speed Linear Products

VIDEO OP AMPS AND BUFFERS

HFA1105
LOW POWER VIDEO OP AMP

AnswerFAX DOCUMENT # 3395

- -3dB Bandwidth (A_V = +2) 330MHz
- High Slew Rate 1000V/µs
- Gain Flatness to 75MHz. . . . . ±0.1dB
- Fast Settling Time (0.1%) 15ns
- Differential Gain/Phase . . . . . .0.02%/0.03 Degrees
- Low Supply Current 6mA
- 8 Lead PDIP and SOIC

HFA1106
VIDEO OP AMP WITH EXTERNAL COMPENSATION

AnswerFAX DOCUMENT # 3922

- Wide -3dB Bandwidth 315MHz
- High Slew Rate 700V/µs
- Differential Gain/Phase. . . . . .0.02%/0.05 Degrees
- Low Supply Current 5.8mA
- Compensation Pin for Bandwidth Limiting
- 8 Lead PDIP and SOIC

HFA1113
PROG. GAIN VIDEO BUFFER WITH OUTPUT LIMITING

AnswerFAX DOCUMENT # 1342

- Wide -3dB Bandwidth 850MHz
- High Slew Rate 2400V/µs
- Differential Gain/Phase. . . . . .0.02%/0.04 Degrees
- User Programmable Gain of +2, ±1
- User Programmable Output Limiting
- 8 Lead PDIP and SOIC

HFA1114
CABLE DRIVING BUFFER WITH SUMMING NODE

AnswerFAX DOCUMENT # 3151

- Wide -3dB Bandwidth 850MHz
- High Slew Rate 2400V/µs
- Differential Gain/Phase. . . . . .0.02%/0.04 Degrees
- User Programmable Gain (+2, ±1)
- Summing Node Pinout Enables Tailoring of System Response For Cable Length
- 8 Lead PDIP and SOIC

HFA1115
LOW POWER PROGRAMMABLE GAIN VIDEO BUFFER

AnswerFAX DOCUMENT # 3606

- Wide -3dB Bandwidth 225MHz
- High Slew Rate 1100V/µs
- Differential Gain/Phase . . . . . 0.02%/0.03 Degrees
- User Programmable Gain (+2, ±1)
- User Programmable Output Limiting
- Low Supply Current. 7mA
- 8 Lead PDIP and SOIC

HFA1135
VIDEO OP AMP WITH OUTPUT LIMITING

AnswerFAX DOCUMENT # 3653

- Wide -3dB Bandwidth 360MHz
- High Slew Rate 1200V/µs
- Fast Settling Time (0.1%) 15ns
- Differential Gain/Phase . . . . . 0.02%/0.04 Degrees
- Low Supply Current. 7mA
- User Programmable Output Limiting
- Fast Overdrive Recovery . . . . . .<1ns
- 8 Lead PDIP and SOIC

HFA1145
LOW POWER VIDEO OP AMP WITH DISABLE

AnswerFAX DOCUMENT # 3955

- -3dB Bandwidth. 330MHz
- High Slew Rate 1000V/µs
- Differential Gain/Phase . . . . . 0.02%/0.03 Degrees
- Gain Flatness to 75MHz. . . . . ±0.1dB
- Low Supply Current. 6mA
- Output Enable/Disable (T_{ON}/T_{OFF} = 180ns/35ns)
- 8 Lead PDIP and SOIC

HFA1205
DUAL LOW POWER VIDEO OP AMP

AnswerFAX DOCUMENT # 3605

- -3dB Bandwidth (A_V = +2). 400MHz
- High Slew Rate 1275V/µs
- Differential Gain/Phase . . . . . 0.03%/0.03 Degrees
- Low Supply Current. . . . . 6mA/Op Amp
- Gain Flatness to 50MHz. . . . . ±0.03dB
- 8 Lead PDIP and SOIC

VIDEO OP AMPS AND BUFFERS (Continued)

HFA1212
DUAL PROGRAMMABLE GAIN VIDEO BUFFER

AnswerFAX DOCUMENT # 3607

- -3dB Bandwidth (A_V = +2) 350MHz
- High Slew Rate 1100V/µs
- Differential Gain/Phase. . . . . .0.02%/0.02 Degrees
- User Programmable Gain (+2, ±1)
- Low Supply Current . . . . . .6mA/Op Amp
- 8 Lead PDIP and SOIC

HA4600
400MHz VIDEO BUFFER WITH OUTPUT DISABLE

AnswerFAX DOCUMENT # 3990

- Low Power Dissipation 105mW
- Symmetrical Slew Rates 1700V/µs
- 0.1dB Gain Flatness 250MHz
- Off Isolation (100MHz) 85dB
- Differential Gain and Phase 0.01%/0.01Degrees
- High ESD Rating. . . . . >2000V

HFA1245
DUAL LOW POWER VIDEO AMP WITH DISABLE

AnswerFAX DOCUMENT # 3682

- -3dB Bandwidth (A_V = +2) 530MHz
- High Slew Rate 1050V/µs
- Differential Gain/Phase. . . . . .0.02%/0.03 Degrees
- Gain Flatness to 50MHz. . . . . ±0.11dB
- Low Supply Current . . . . . .6mA/Op Amp
- Output Enable/Disable (T_{ON}/T_{OFF} = 160ns/20ns)
- 14 Lead PDIP and SOIC

HA5013
TRIPLE 125MHz VIDEO OP AMP

AnswerFAX DOCUMENT # 3654

- Wide -3dB Bandwidth 125MHz
- High Slew Rate 475V/µs
- Differential Gain/Phase . . . . . 0.03%/0.03 Degrees
- High ESD Protection 4000V
- Low Supply Current. . . . . .7.5mA/Op Amp
- 14 Lead PDIP and SOIC

HFA1405
QUAD LOW POWER VIDEO OP AMP

AnswerFAX DOCUMENT # 3604

- -3dB Bandwidth (A_V = +2) 560MHz
- High Slew Rate 1700V/µs
- Differential Gain/Phase. . . . . .0.02%/0.03 Degrees
- Gain Flatness to 50MHz. . . . . ±0.03dB
- Low Supply Current . . . . . .6mA/Op Amp
- 14 Lead SOIC

HA5022
DUAL 125MHz VIDEO AMP WITH DISABLE

AnswerFAX DOCUMENT # 3392

- Wide -3dB Bandwidth 125MHz
- High Slew Rate 475V/µs
- Differential Gain/Phase . . . . . 0.03%/0.03 Degrees
- High ESD Protection 4000V
- Low Supply Current. . . . . .7.5mA/Op Amp
- Individual Output Disable/Enable
- 16 Lead PDIP and SOIC

HFA1412
QUAD PROGRAMMABLE GAIN VIDEO BUFFER

AnswerFAX DOCUMENT # 3607

- -3dB Bandwidth (A_V = +2) 350MHz
- High Slew Rate 1100V/µs
- Differential Gain/Phase. . . . . .0.02%/0.02 Degrees
- User Programmable Gain (+2, ±1)
- Low Supply Current . . . . . .6mA/Op Amp
- 14 Lead PDIP and SOIC

HA5023
DUAL 125MHz VIDEO OP AMP

AnswerFAX DOCUMENT # 3393

- Wide -3dB Bandwidth 125MHz
- High Slew Rate 475V/µs
- Differential Gain/Phase . . . . . 0.03%/0.03 Degrees
- High ESD Protection 4000V
- Low Supply Current. . . . . .7.5mA/Op Amp
- 8 Lead PDIP and SOIC

VIDEO OP AMPS AND BUFFERS (Continued)

HA5024
QUAD 125MHz VIDEO OP AMP WITH DISABLE

AnswerFAX DOCUMENT # 3550

- Wide -3dB Bandwidth 125MHz
- High Slew Rate 475V/µs
- Differential Gain/Phase . . . . . .0.03%/0.03 Degrees
- High ESD Protection 4000V
- Low Supply Current . . . . . 7.5mA/Op Amp
- Individual Output Disable/Enable
- 20 Lead PDIP and SOIC

HA5025
QUAD 125MHz VIDEO OP AMP

AnswerFAX DOCUMENT # 3591

- Wide -3dB Bandwidth 125MHz
- High Slew Rate 475V/µs
- Differential Gain/Phase . . . . . 0.03%/0.03 Degrees
- High ESD Protection 4000V
- Low Supply Current. . . . . .7.5mA/Op Amp
- 14 Lead PDIP and SOIC

SAMPLE/HOLD

HA5351, HA5352
FAST ACQUISITION SAMPLE/HOLD

AnswerFAX DOCUMENT # 3690, (HA5351)
AnswerFAX DOCUMENT # 3394, (HA5352)

- Fast Acquisition to 0.01% 70ns
- Low Offset Error 2mV
- Low Pedestal Error 10mV
- Low Droop Rate. 2µV/µs
- Wide Unity Gain Bandwidth. 40MHz
- Low THD (Hold Mode). . . . . -72dBc
- Low Power Dissipation 220mW
- Single (HA5351), Dual (HA5352)

PIN DRIVER

HFA5251
ULTRA HIGH SPEED ATE PIN DRIVERS

AnswerFAX DOCUMENT # 3689

- High ECL Data Rate 800MHz
- $1V_{P-P}$ Rise/Fall Time 500ps
- Precise Output Impedance 50Ω
- Output Swing . . . . . -2V to +7V
- High Impedance Three-State Output Control
- Die Form Only

HFA5250
HIGH SPEED MONOLITHIC PIN DRIVER

AnswerFAX DOCUMENT # 2943

- High ECL Data Rate 500MHz
- $1V_{P-P}$ Rise/Fall Time 600ps
- Precise Output Impedance 50Ω
- Wide Output Range. . . . . .+7V to -2V
- High Impedance Three-State Output Control
- Very Fast Slew Rate 2500V/µs

HFA5253
ULTRA HIGH SPEED ATE PIN DRIVER

AnswerFAX DOCUMENT # 4003

- High ECL Data Rate 800MHz
- $1V_{P-P}$ Rise/Fall Time 500ps
- Wide Output Swing . . . . . .-3V to +8V
- Precise Output Impedance 50Ω
- HIZ Output Leakage 100nA
- Slew Rate Control
- 20 Lead Power SOIC and Die

WIRELESS COMMUNICATIONS

HFA3046, HFA3096, HFA3127, HFA3128
ULTRA HIGH FREQUENCY TRANSISTOR ARRAYS

AnswerFAX DOCUMENT # 3076

- NPN Transistor F_T 8GHz
- NPN Current Gain (h_{FE}) 70
- PNP Transistor F_T 5.5GHz
- PNP Current Gain (h_{FE}) 40

HFA3102
DUAL DIFFERENTIAL AMPLIFIER

AnswerFAX DOCUMENT # 3635

- High Gain Bandwidth Product 10GHz
- High Power Gain BW Product 5GHz
- High Current Gain (h_{FE}) 70
- Pin Compatible to UPA102G
- 14 Lead SOIC

HFA3101
GILBERT CELL TRANSISTOR ARRAY

AnswerFAX DOCUMENT # 3663

- NPN Transistor Array Configured as a Gilbert Cell
- High Gain Bandwidth Product 10GHz
- High Power Gain BW Product 5GHz
- Current Gain (h_{FE}) 70
- Low Collector Leakage Current . . . . . <0.01nA
- Pin Compatible to UPA101
- 8 Lead SOIC

HFA3600
LOW NOISE AMPLIFIER/MIXER

AnswerFAX DOCUMENT # 3655

- Low Noise Figure
  - LNA . . . . . 2.3dB at 900MHz
  - Mixer . . . . . 12.1dB at 900MHz
  - LNA + Mixer. . . . . 3.97dB at 900MHz
- High Power Gain
  - LNA . . . . . 12.8dB at 900MHz
  - Mixer . . . . . 7.0dB at 900MHz
  - LNA + Mixer. . . . . 19.8dB at 900MHz
- High Intercept
  - LNA . . . . . +12.8dBm at Output
  - Mixer . . . . . +3.2dBm at Output
  - LNA + Mixer. . . . . -16.7dBm at Input
- 14 Lead SOIC

VIDEO CROSSPOINT SWITCHES

HA4201
WIDEBAND CROSSPOINT SWITCH WITH TALLY OUTPUT

AnswerFAX DOCUMENT # 3680

- Low Power Dissipation. 105mW
- Symmetrical Slew Rates 1700V/µs
- 0.1dB Gain Flatness 250MHz
- Off Isolation (100MHz) 85dB
- Differential Gain 0.01%
- Differential Phase. . . . . 0.01 Degrees

HA4344B
400MHz 4 x 1, VIDEO CROSSPOINT SWITCH

AnswerFAX DOCUMENT # 3956

- Synchronous Controls (Latched)
- Low Power Dissipation 105mW
- Symmetrical Slew Rates 1400V/µs
- 0.1dB Gain Flatness 165MHz
- Differential Gain/Phase . . . . . 0.01%/0.01 Degrees
- 16 Lead PDIP, SOIC

HA4314A
400MHz 4 x 1, VIDEO CROSSPOINT SWITCH

AnswerFAX DOCUMENT # 3679

- Low Power Dissipation. 105mW
- Symmetrical Slew Rates 1400V/µs
- 0.1dB Gain Flatness 100MHz
- Differential Gain/Phase . . . . . 0.01%/0.01 Degrees
- Pin Compatible to GX4314/L
- 14 Lead PDIP, SOIC

HA4404A
400MHz 4 x 1, VIDEO CROSSPOINT SWITCH

AnswerFAX DOCUMENT # 3678

- Open Collector Tally Outputs
- Low Power Dissipation 105mW
- Symmetrical Slew Rates 1400V/µs
- 0.1dB Gain Flatness 165MHz
- Differential Gain/Phase . . . . . 0.01%/0.01 Degrees
- 16 Lead PDIP, SOIC

Linear Selection Trees for New Products

OPERATIONAL AMPLIFIERS

HIGH SPEED
Bandwidth >100MHz

OUTPUT LIMITING

HFA1130
HFA1135

EXTERNAL COMPENSATION

HFA1102
HFA1106

SYNC STRIPPER

HFA1103

DISABLE/ENABLE

HA5020
HFA1145
HA5022 (Dual)
HFA1245 (Dual)
HA5024 (Quad)

DUAL OP AMPS

HA5023
HFA1205
HA5022 (Disable)
HFA1245 (Disable)

TRIPLE OP AMPS

HA5013

QUAD OP AMPS

HA5025
HFA1405
HA5024 (Disable)

HIGH SLEW RATE
>1000V/µs

HFA1100
HFA1102
HFA1105
HFA1120
HFA1130
HFA1135
HFA1145
HFA1205
HFA1245
HFA1405

LOW POWER
<10mA/Amplifier

HA5013
HA5020
HA5022
HA5023
HA5024
HA5025
HFA1105
HFA1106
HFA1135
HFA1145
HFA1205
HFA1245
HFA1405

HFA1100 SERIES OP AMPS AND BUFFERS

STANDARD OPERATIONAL AMPLIFIER PINOUT

OP AMPS
8 Lead PDIP, SOIC

HFA1100
850MHz

HFA1102
600MHz
with Compensation

HFA1120
850MHz
with Balance Pins

HFA1130
850MHz
with Output Limiting

STANDARD BUFFER PINOUT

STANDARD OPERATIONAL AMPLIFIER PINOUT AND PROGRAMMABLE GAIN (+2, ±1)

BUFFERS
8 Lead PDIP, SOIC

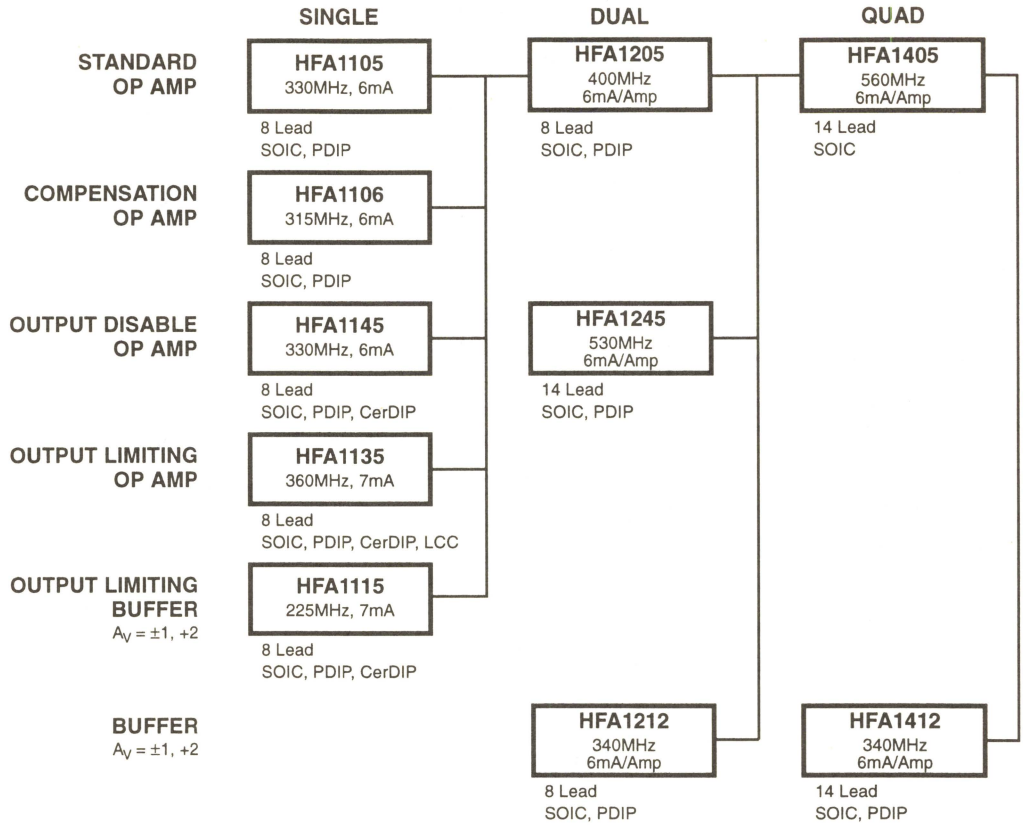
HFA1110
750MHz
Fixed +1 Gain

HFA1112
850MHz

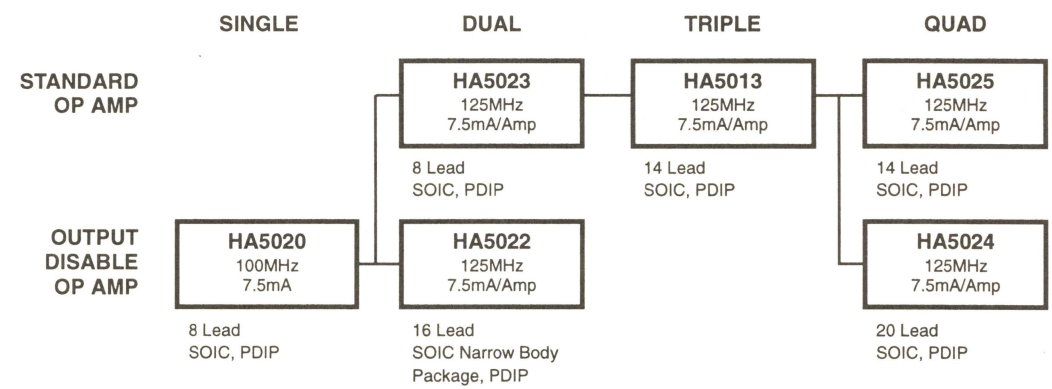
HFA1113
850MHz
with Output Limiting

HFA1114
850MHz
with Summing Node Pinout

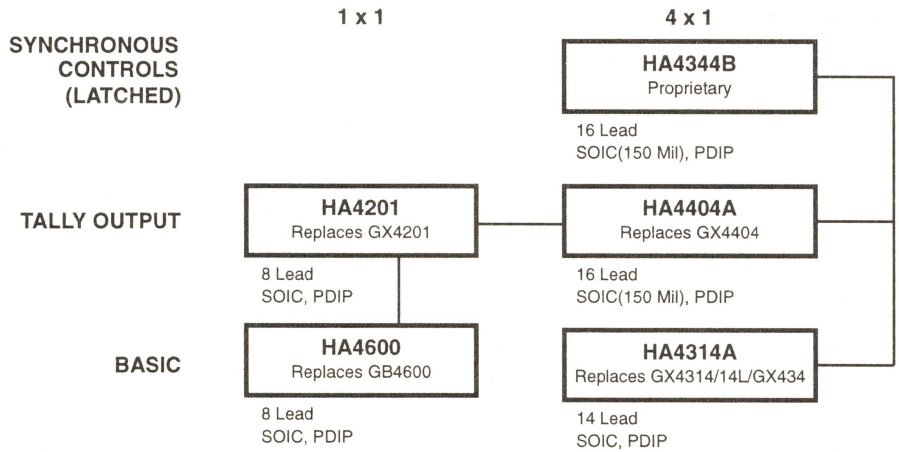
360MHz HFA1105 SERIES OP AMPS AND BUFFERS



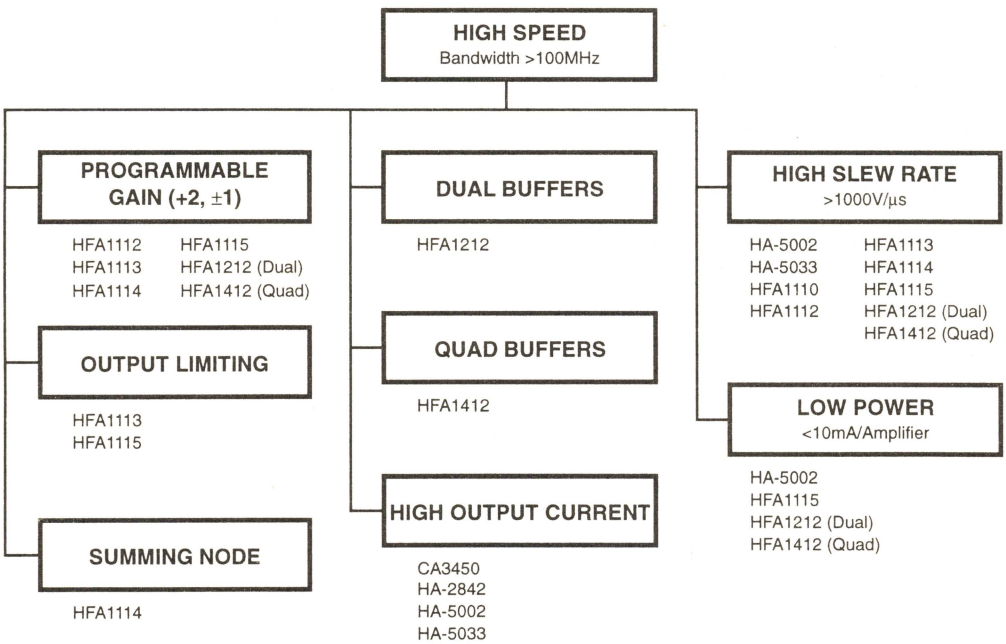
HA5020 SERIES VIDEO OPERATIONAL AMPLIFIERS



LOW POWER VIDEO CROSSPOINT SWITCHES



BUFFERS



Linear Ordering Information

HFA HARRIS PRODUCT CODE EXAMPLE

H FA 1100 I B /883

PREFIX
H: Harris

FAMILY
FA: Ultra-High Speed Analog

PART NUMBER

TEMPERATURE
C: Commercial, 0°C to +70°C
I: Industrial, -40°C to +85°C
M: Military/883, -55°C to +125°C

PACKAGE
B: Small Outline, SOIC
J: Ceramic DIP
P: Plastic DIP
Y: Dice
L: Ceramic LCC

HIGH RELIABILITY DESIGNATOR
/883: Fully Compliant to MIL-STD-883 Class B/QML

HA HARRIS PRODUCT CODE EXAMPLE

H A 7 - 5147 - 5

PREFIX
H: Harris

FAMILY
A: Analog

PACKAGE
1: Ceramic DIP
2: Metal Can
3: Plastic DIP
4P: Plastic Leaded Chip Carrier
7: 8 Lead Ceramic DIP
9P: Small Outline (SOIC)
0: Chip Form

PART NUMBER

TEMPERATURE
2: -55°C to +125°C
4: -25°C to +85°C
5: 0°C to +75°C
7: Dash-7 High Reliability Commercial Product 0°C to +75°C, includes 96 hour Burn-In
8: -55°C to +125°C, Harris Class B Equiv. Devices
/883: Fully Compliant to MIL-STD-883

ICL/ICM/LM

DEVICE FAMILY PREFIXES

PREFIX	DEVICE FAMILY
ICL	Linear IC
ICM	Microperipheral IC
LM	National Semiconductor Alternate Source

PACKAGE TYPE DESIGNATORS

SUFFIX	PACKAGE
B	Small Outline IC (SOIC)
J	Ceramic Dual-In-Line
P	Plastic Dual-In-Line
T	TO-99, TO-100

PIN COUNT DESIGNATOR

SUFFIX	PIN COUNT	DIAMETER
A	8	
B	10	
C	12	
D	14	
E	16	
V	8	0.200″ pin circle, isolated case
W	10	0.230″ pin circle, isolated case
X	10	0.230″ pin circle, case to pin 5
Y	8	0.200″ pin circle, case to pin 4
Z	8	0.230″ pin circle, case to pin 5

TEMPERATURE RANGE DESIGNATORS

SUFFIX	TEMPERATURE RANGE
C	Commercial: 0°C to +70°C
I	Industrial: Either -25°C to +85°C or -40°C to +85°C (Specified on Datasheet)
M	Military: -55°C to +125°C

PART NUMBERING SYSTEM

All Part Numbers consist of a Device Family Prefix, a Basic Numeric Part Number, and an Option Suffix, as follows:

1, 2 or 3 Digit Prefix	3, 4 or 5 Digit Unique Device Number	3 or 4 Digit Option Suffix	High Reliability Designator
XXX	XXX X	X X X X	/XXXX

- Pin Count Designator
- Package Type Designator
- Temperature Range Designator
- Electrical Option Designator Only. Used if more than one electrical option is available
- Variation of basic device type designator. Only used if more than one basic device is available.
- 3 or 4 digit basic device type part number
- Device family prefix

CA Type

Linear (CA Series)

Linear ICs are available in a wide variety of package designs. These packages are identified by suffix letters indicated in the chart below. When ordering Linear devices, it is important that the appropriate suffix letter be affixed to the type number as indicated on the price schedule.

PACKAGE	CA SERIES
Dual-In-Line Ceramic Sidebraze	D
Dual-In-Line Plastic	E
Frit-Seal Dual-In-Line Ceramic	F
Quad-In-Line Plastic	Q
Plastic Lead Chip Carrier	Q
Dual-In-LIne Formed Lead TO-5	S
TO-5 Style Package	T
Small Outline (SOIC) Plastic	M

Extra Value Screening

Linear product with extra value screening has an X added to the standard type number in the price list, and is also branded as such. A white dot will indicate location of Pin 1.

Example:

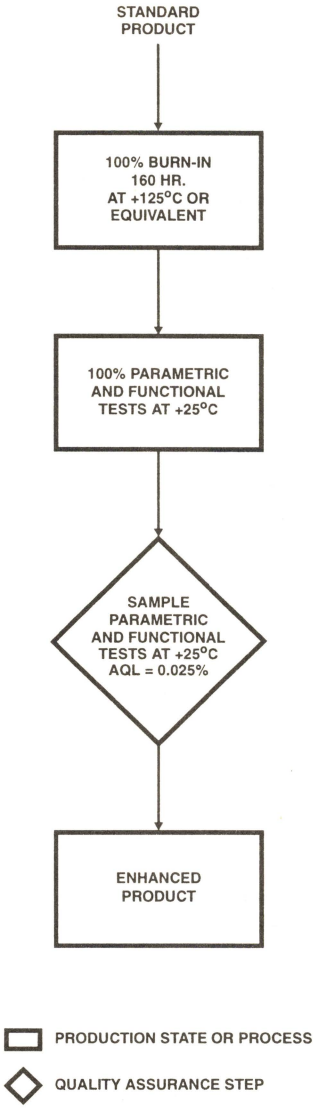
A CA3080E with Extra Value screening is designated CA3080EX in the price list. It is branded CA3080EX plus a white dot at pin number 1.

Tape and Reel for Small Outline Packages

With the introduction of small outline packages, Harris now offers its customers the convenient tape and reel style packaging. Small outline devices, which can be tape and reeled, are denoted with the suffix "M96" or "AM96" in the linear and high speed logic product lines. Devices must be ordered in multiples of quantities listed below. Any returns must be full and unopened reels.

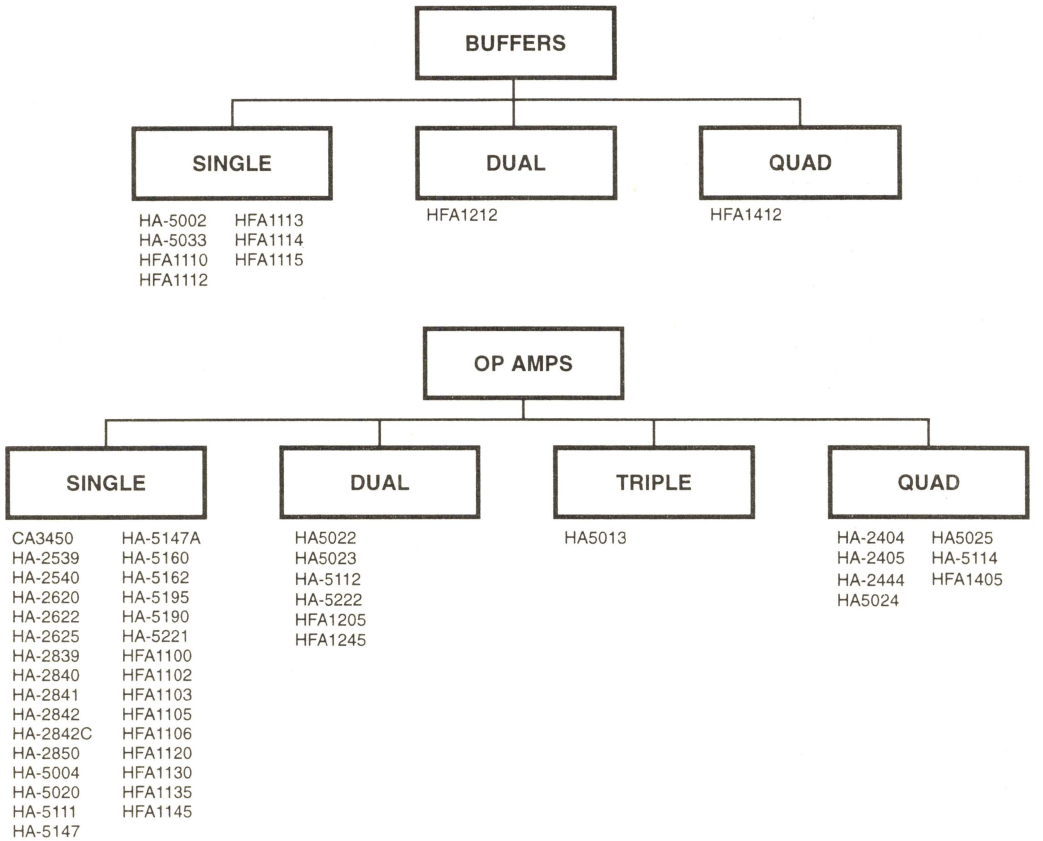
LEAD COUNT	TAPE WIDTH (mm)	REEL SIZE (INCHES)	DEVICES PER REEL
8	12	13	2500
14	16	13	2500
16	16	13	2500
24	24	13	1000

PRODUCT FLOW



Linear Selection Guide

WIDEBAND OPERATIONAL AMPLIFIERS AND BUFFERS



WIDEBAND: Min/Max Limits at +25°C, Unless Otherwise Specified

DEVICE	GBWP (TYP) (MHz)	FPBW (TYP) (MHz)	SLEW RATE (TYP) (V/μs)	A_{VOL} (dB)/ A_{ZOL} (V/mA)	MINIMUM STABLE GAIN	OFFSET VOLTAGE (mV)	BIAS CURRENT (nA)	CMRR (dB)	PSRR (dB)	SUPPLY CURRENT (mA/OP AMP)
BUFFERS										
HFA1112	850	260	2400	-	+1, -1, +2	25	35000	-	39	26
HFA1113	850	260	2400	-	+1, -1, +2	25	35000	-	39	26
HFA1114	**850**	**260**	**2400**	**-**	**+1, -1, +2**	**25**	**35000**	**-**	**39**	**26**
HFA1110	750	150	1300	-	+1	25	40000	-	39	26
HA-5033	250	17.5	1100	-	+1	15	35000	-	54	25
HFA1115	**225**	**140**	**1100**	**-**	**+1, -1, +2**	**10**	**15000**	**-**	**45**	**7.1**
HA-5002	110	20.7	1300	-	+1	20	7000	-	54	10
DUAL BUFFERS										
HFA1212	**340**	**140**	**1100**	**-**	**+1, -1, +2**	**10**	**15000**	**-**	**45**	**6.1**

NOTE: Bold type designates a new product from Harris.

WIDEBAND: Min/Max Limits at +25°C, Unless Otherwise Specified **(Continued)**

DEVICE	GBWP (TYP) (MHz)	FPBW (TYP) (MHz)	SLEW RATE (TYP) (V/µs)	A_{VOL} (dB)/ A_{ZOL} (V/mA)	MINIMUM STABLE GAIN	OFFSET VOLTAGE (mV)	BIAS CURRENT (nA)	CMRR (dB)	PSRR (dB)	SUPPLY CURRENT (mA/OP AMP)
QUAD BUFFERS										
HFA1412	**225**	**140**	**1100**	-	**+1, -1, +2**	**10**	**15000**	-	**45**	**6.1**
SINGLE OP AMPS										
HFA1100	850	300	2300	500 (Note 1)	1	6.0	40000	40	45	26
HFA1120	850	300	2300	500 (Note 1)	1	6.0	40000	40	45	26
HFA1130	850	300	2300	500 (Note 1)	1	6.0	40000	40	45	26
HA-2539	600	9.5	600	80	10	10.0	20000	60	60	25.0
HA-2839	600	10.0	625	86	10	2.0	14500	75	75	15
HA-2840	600	10.0	625	86	10	2.0	14500	75	75	15
HA-2850	470	5.4	340	86	10	2.0	14500	75	75	8
HA-2540	400	6.0	400	80	10	10.0	20000	60	60	25.0
HFA1105	**350**	**140**	**1000**	**500** (Note 1)	**1**	**5.0**	**15000**	**47**	**50**	**6.1**
HFA1145	**350**	**140**	**1000**	**500** (Note 1)	**1**	**5.0**	**15000**	**47**	**50**	**6.1**
HFA1135	**350**	**170**	**1200**	**500** (Note 1)	**1**	**5.0**	**15000**	**47**	**50**	**7.1**
HFA1106	**315**	**100**	**700**	**500** (Note 1)	**1** (Note 2)	**5.0**	**15000**	**47**	**50**	**6.1**
CA3450	188	7.2	330	60	1	20	400	50	55	40
HA-2548	150	1.91	120	114	5 (Note 2)	0.9	50	80	86	18.0
HA-5190	150	6.5	200	83	5	5.0	15000	74	70	28.0
HA-5195	150	6.5	200	83	5	6.0	15000	74	70	28.0
HA-5147	140	0.5	35	117	10	0.1	80	100	86	4
HA-5147A	120	0.5	35	120	10	0.03	40	114	108	4
HA-5004	100	50	1200	100 (Note 1)	1	5.0	5000	58	50	16
HA-5020	100	17.5	1100	3500 (Note 1)	1	8.0	8000	60	64	10
HA-2620	100	0.6	35	100	5 (Note 2)	4.0	15	80	80	3.7
HA-2622	100	0.6	35	98	5 (Note 2)	5.0	25	74	74	4.0
HA-2625	100	0.6	35	98	5 (Note 2)	5.0	25	74	74	4.0
HA-5111	100	0.8	50	120	10 (Note 2)	3.0	200	80	80	6.0

NOTE: Bold type designates a new product from Harris.

WIDEBAND: Min/Max Limits at +25°C, Unless Otherwise Specified **(Continued)**

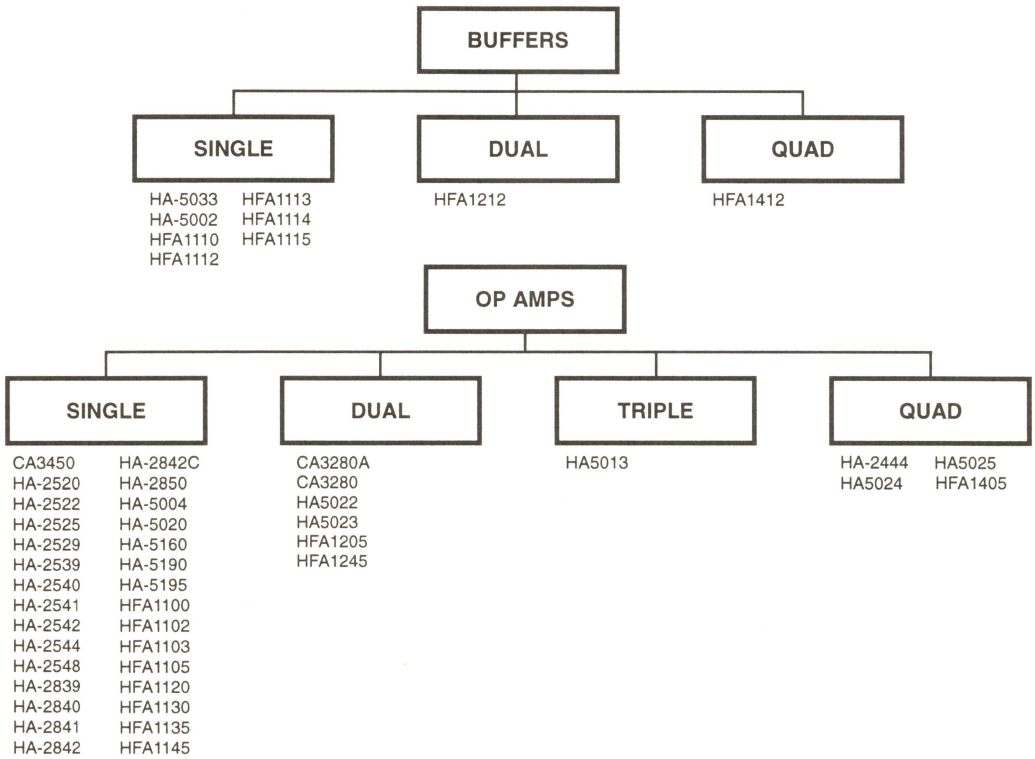
DEVICE	GBWP (TYP) (MHz)	FPBW (TYP) (MHz)	SLEW RATE (TYP) (V/µs)	A_{VOL} (dB)/ A_{ZOL} (V/mA)	MINIMUM STABLE GAIN	OFFSET VOLTAGE (mV)	BIAS CURRENT (nA)	CMRR (dB)	PSRR (dB)	SUPPLY CURRENT (mA/OP AMP)
HA-5160	100	1.9	120	97	10 (Note 2)	3.0	0.05	74	74	10
HA-5162	100	1.10	70	88	10 (Note 2)	15.0	0.065	70	70	12
HA-5221	100	0.56	35	106	1	0.75	80	86	86	11
HA-2842C	**150**	**18.0**	**1200**	**94**	**5** (Note 2)	**3.0**	**10000**	**80**	**70**	**15**
HA-2842	80	6.0	400	94	2	3.0	10000	80	70	15
HA-2841	50	3.8	240	88	1	3.0	10000	80	70	11
DUAL OP AMPS										
HFA1245	**530**	**150**	**1050**	**500** (Note 1)	**1**	**5**	**15000**	**45**	**48**	**6.1**
HFA1205	**400**	**180**	**1275**	**500** (Note 1)	**1**	**5**	**15000**	**45**	**48**	**6.1**
HA5022	**125**	**28**	**475**	**1000** (Note 1)	**1**	**3.0**	**8000**	**53**	**60**	**10**
HA5023	**125**	**28**	**475**	**1000** (Note 1)	**1**	**3.0**	**8000**	**53**	**60**	**10**
HA-5222	100.0	0.56	35	106	1	0.75	80.0	86	86	11.0
HA-5112	60.0	0.32	20	100	10	2.0	200.0	86	86	2.5
TRIPLE OP AMPS										
HA5013	**125**	**28**	**475**	**3500** (Note 1)	**1**	**3.0**	**8000**	**53**	**60**	**10**
QUAD OP AMPS										
HFA1405	**400**	**TBD**	**1000**	**500** (Note 1)	**1**	**5**	**15000**	**45**	**48**	**6.1**
HA5024	**125**	**28**	**475**	**3500** (Note 1)	**1**	**3.0**	**8000**	**53**	**60**	**10**
HA5025	**125**	**28**	**475**	**3500** (Note 1)	**1**	**3.0**	**8000**	**53**	**60**	**10**
HA-5114	60.0	0.32	20.0	100	10	2.5	200.0	86	86	1.63
HA-2444	50.0	5.1	160	71	1	7.0	15000	70	65	6.25
HA-2400	40.0	0.95	30.0	94	10 (Note 2)	9.0	200.0	80	74	1.50
HA-2404	40.0	0.95	30.0	94	10 (Note 2)	9.0	200.0	80	74	1.50
HA-2405	40.0	0.95	30.0	94	10 (Note 2)	9.0	250.0	74	74	1.50

NOTES:

1. A_{ZOL} applies to current feedback amplifiers only (HA-5004, HA-502X, HFA11XX, HFA12XX, HFA14XX).
2. Product features an external compensation pin to limit bandwidth for noise reduction or to allow unity gain operation.

NOTE: Bold type designates a new product from Harris.

HIGH SLEW RATE OPERATIONAL AMPLIFIERS AND BUFFERS



HIGH SLEW RATE: Min/Max Limits at +25°C, Unless Otherwise Specified

DEVICE	SLEW RATE (TYP) (V/µs)	GBWP (TYP) (MHz)	FPBW (TYP) (MHz)	A_{VOL} (dB)/ A_{ZOL} (V/mA)	MINIMUM STABLE GAIN	OFFSET VOLTAGE (mV)	BIAS CURRENT (nA)	CMRR (dB)	PSRR (dB)	SUPPLY CURRENT (mA/OP AMP)
BUFFERS										
HFA1112	2400	850	260	-	+1, -1, +2	25.0	35000	-	39	26
HFA1113	2400	850	260	-	+1, -1, +2	25.0	35000	-	39	26
HFA1114	**2400**	**850**	**260**	**-**	**+1, -1, +2**	**25**	**35000**	**-**	**39**	**26**
HFA1110	1300	750	150	-	+1	25.0	40000	-	39	26
HA-5002	1300	110	20.7	-	+1	20.0	7000	-	54	10
HFA1115	**1100**	**225**	**140**	**-**	**+1, -1, +2**	**10**	**15000**	**-**	**45**	**7.1**
HA-5033	1100	250	17.5	-	+1	15.0	35000	-	54	25
DUAL BUFFERS										
HFA1212	**1100**	**340**	**140**	**-**	**+1, -1, +2**	**10**	**15000**	**-**	**45**	**6.1**
QUAD BUFFERS										
HFA1412	**1100**	**225**	**140**	**-**	**+1, -1, +2**	**10**	**15000**	**-**	**45**	**6.1**

NOTE: Bold type designates a new product from Harris.

HIGH SLEW RATE: Min/Max Limits at +25°C, Unless Otherwise Specified **(Continued)**

DEVICE	SLEW RATE (TYP) (V/µs)	GBWP (TYP) (MHz)	FPBW (TYP) (MHz)	A_{VOL} (dB)/ A_{ZOL} (V/mA)	MINIMUM STABLE GAIN	OFFSET VOLTAGE (mV)	BIAS CURRENT (nA)	CMRR (dB)	PSRR (dB)	SUPPLY CURRENT (mA/OP AMP)
SINGLE OP AMPS										
HFA1100	2300	850	300	500 (Note 1)	1	6.0	40000	40	45	26
HFA1120	2300	850	300	500 (Note 1)	1	6.0	40000	40	45	26
HFA1130	2300	850	300	500 (Note 1)	1	6.0	40000	40	45	26
HFA1135	**1200**	**350**	**170**	**500** (Note 1)	**1**	**5.0**	**15000**	**47**	**50**	**7.1**
HA-5004	1200	100	50	100 (Note 1)	1	5.0	5000	58	50	16
HA2842C	**1200**	**150**	**18.0**	**94**	**5** (Note 2)	**3.0**	**10000**	**80**	**70**	**15**
HA-5020	1100	100	17.5	3500 (Note 1)	1	8.0	8000	60	64	10
HFA1105	**1000**	**350**	**140**	**500** (Note 1)	**1**	**5.0**	**15000**	**47**	**50**	**6.1**
HFA1145	**1000**	**350**	**140**	**500** (Note 1)	**1**	**5.0**	**15000**	**47**	**50**	**6.1**
HA-2839	625	600	10.0	86	10	2.0	14500	75	75	15
HA-2840	625	600	10.0	86	10	2.0	14500	75	75	15
HA-2539	600	600	9.5	80	10	10.0	20000	60	60	25.0
HA-2540	400	400	6.0	80	10	10.0	20000	60	60	25.0
HA-2842	400	80	6.0	94	2	3.0	10000	80	70	15
HA-2542	350	70	5.5	80	2 (Note 2)	10.0	35000	70	70	34.5
HA-2850	340	400	5.4	86	10	2.0	14500	75	75	8
CA3450	330	188	7.2	60	1	20.0	400	50	55	40
HA-2841	240	50	3.8	88	1	3.0	10000	80	70	11
HA-2541	250	40	4.0	80	1	2.0	35000	70	70	40.0
HA-5190	200	150	6.5	83	5	5.0	15000	74	70	28.0
HA-5195	200	150	6.5	83	5	6.0	15000	74	70	28.0
HA-2529	150	20	2.6	80	3 (Note 2)	5.0	200	80	80	6.0
HA-2544	150	50	4.2	71	1	15.0	15000	75	70	12.0
HA-2520	120	20	2	80	3 (Note 2)	8.0	200	80	80	6.0
HA-2522	120	20	2	78	3 (Note 2)	10.0	250	74	74	6.0

NOTE: Bold type designates a new product from Harris.

HIGH SLEW RATE: Min/Max Limits at +25°C, Unless Otherwise Specified **(Continued)**

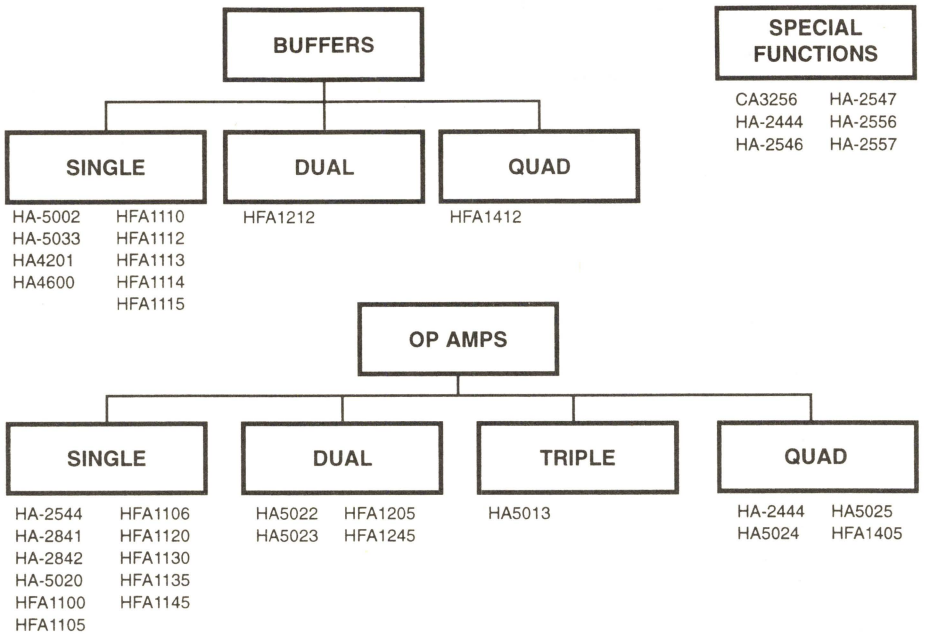
DEVICE	SLEW RATE (TYP) (V/μs)	GBWP (TYP) (MHz)	FPBW (TYP) (MHz)	A_{VOL} (dB)/ A_{ZOL} (V/mA)	MINIMUM STABLE GAIN	OFFSET VOLTAGE (mV)	BIAS CURRENT (nA)	CMRR (dB)	PSRR (dB)	SUPPLY CURRENT (mA/OP AMP)
HA-2525	120	20	2	78	3 (Note 2)	10.0	250	74	74	6.0
HA-2548	120	150	1.91	114	5 (Note 2)	0.9	50	80	86	18.0
HA-5160	120	100	1.9	97	10 (Note 2)	3.0	0.05	74	74	10
DUAL OP AMPS										
HFA1205	**1275**	**400**	**140**	**500** (Note 1)	**1**	**5**	**15000**	**45**	**48**	**6.1**
HFA1245	**1050**	**530**	**130**	**500** (Note 1)	**1**	**5**	**15000**	**45**	**48**	**6.1**
HA5022	**475**	**125**	**28**	**1000** (Note 1)	**1**	**3.0**	**8000**	**53**	**60**	**10**
HA5023	**475**	**125**	**28**	**1000** (Note 1)	**1**	**3.0**	**8000**	**53**	**60**	**10**
CA3280	125	9.0	1.99	94	1	3.0	5000	80	86	2.4
CA3280A	125	9.0	1.99	94	1	0.5	5000	94	94	2.4
TRIPLE OP AMPS										
HA5013	**475**	**125**	**28**	**3500** (Note 1)	**1**	**3.0**	**8000**	**53**	**60**	**10**
QUAD OP AMPS										
HFA1405	**1000**	**400**	**TBD**	**500** (Note 1)	**1**	**5.0**	**15000**	**45**	**48**	**6.1**
HA5024	**475**	**125**	**28**	**3500** (Note 1)	**1**	**3.0**	**8000**	**53**	**60**	**10**
HA5025	**475**	**125**	**28**	**3500** (Note 1)	**1**	**3.0**	**8000**	**53**	**60**	**10**
HA-2444	160	50	5.1	71	1	7.0	15000	70	65	6.25

NOTES:

1. A_{ZOL} applies to current feedback amplifiers only (HA-5004, HA-502X, HFA11XX, HFA12XX, HFA14XX).
2. Product features an external compensation pin to limit bandwidth for noise reduction or to allow unity gain operation.

NOTE: Bold type designates a new product from Harris.

VIDEO OPERATIONAL AMPLIFIERS, BUFFERS, AND SPECIAL FUNCTIONS



VIDEO: Typical Values at +25°C, Unless Otherwise Specified

DEVICE	FEATURES	DIF. GAIN (%)	DIF. PHASE (DEG)	0.1dB FLAT GAIN (MHz)	GBWP (MHz)	SLEW RATE (V/µs)	OUTPUT CURRENT (mA)	SUPPLY VOLTAGE RANGE (±V)	SUPPLY CURRENT (mA/OP AMP)
BUFFERS									
HA4600	Video Buffer w/Output Disable	0.02	0.02	200	400	1400	15	4.5 - 5.5	13
HA4201	1x1 Video Crosspoint/Buffer	0.02	0.02	200	400	1400	15	4.5 - 5.5	13
HFA1110	+1, Std. Buffer Pinout	0.02	0.02	>100	750	1300	60	4.5 - 5.5	21.0
HFA1112	-1, +1, +2 (Selectable) Standard Op Amp Pinout	0.02	0.04	>100	850	2400	60	4.5 - 5.5	21.0
HFA1113	**-1, +1, +2 (Selectable) Standard Op Amp Pinout, V_{OUT} Limits**	**0.02**	**0.04**	**>100**	**850**	**2400**	**60**	**4.5 - 5.5**	**21.0**
HFA1114	**-1, +1, +2 (Selectable) Summing Node Pinout**	**0.02**	**0.04**	**>100**	**850**	**1100**	**60**	**4.5 - 5.5**	**5.9**
HFA1115	-1, +1, +2 (Selectable) Standard Op Amp Pinout, V_{OUT} Limits	0.02	0.03	>50	225	1100	60	4.5 - 5.5	5.9
HA-5033	+1, Std. Buffer Pinout	0.03	0.02	-	250	1100	100	5 - 16	21.0
HA-5002	+1, Std. Buffer Pinout	0.06	0.21	-	110	1300	200	5 - 20	8.3
DUAL BUFFERS									
HFA1212	**-1, +1, +2 (Selectable)**	**0.02**	**0.02**	**>50**	**340**	**1100**	**60**	**4.5 - 5.5**	**5.9**
QUAD BUFFERS									
HFA1412	**-1, +1, +2 (Selectable)**	**0.02**	**0.02**	**>50**	**225**	**1100**	**60**	**4.5 - 5.5**	**5.9**

NOTE: Bold type designates a new product from Harris.

VIDEO: Typical Values at +25°C, Unless Otherwise Specified **(Continued)**

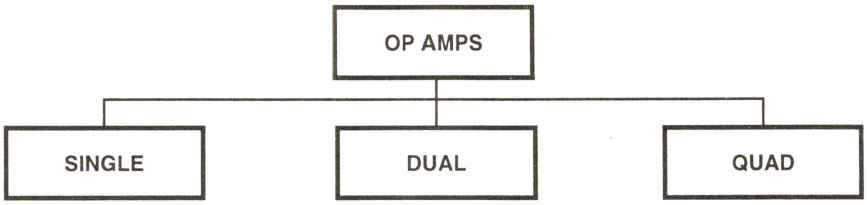
DEVICE	FEATURES	DIF. GAIN (%)	DIF. PHASE (DEG)	0.1dB FLAT GAIN (MHz)	GBWP (MHz)	SLEW RATE (V/µs)	OUTPUT CURRENT (mA)	SUPPLY VOLTAGE RANGE (±V)	SUPPLY CURRENT (mA/OP AMP)
SINGLE OP AMPS									
HFA1105	**$A_V \geq 1$, Low I_{CC}, CFB**	**0.02**	**0.03**	**>50**	**350**	**1000**	**60**	**4.5 - 5.5**	**5.9**
HFA1145	**$A_V \geq 1$, Low I_{CC}, CFB, Output Disable**	**0.02**	**0.03**	**>50**	**350**	**1000**	**60**	**4.5 - 5.5**	**5.9**
HFA1135	**$A_V \geq 1$, Low I_{CC}, CFB, Programmable Output Limiting**	**0.02**	**0.04**	**>50**	**360**	**1200**	**60**	**4.5 - 5.5**	**6.9**
HFA1106	**HFA1105 with Compensation Pin for Bandwidth Limiting**	**0.02**	**0.05**	**100**	**315**	**700**	**60**	**4.5 - 5.5**	**5.9**
HA-2842	$A_V \geq 2$, Cable Driver	0.02	0.03	>10	80	400	100	6 - 17	14.2
HA-5020	$A_V \geq 1$, Output Disable, CFB (Current Feedback)	0.02	0.03	5	100	1100	32	4.5 - 18	7.5
HFA1100	$A_V \geq 1$, CFB	0.03	0.05	75	850	2300	60	4.5 - 5.5	21.0
HFA1120	HFA1100 with Offset Adjust	0.03	0.05	75	850	2300	60	4.5 - 5.5	21.0
HFA1130	$A_V \geq 1$, CFB, Programmable Output Limiting	0.03	0.05	75	850	2300	60	4.5 - 5-5	21.0
HA-2544	$A_V \geq 1$	0.03	0.03	5	50	150	35	8 - 17	10.0
HA-2841	$A_V \geq 1$, Low I_{CC}	0.03	0.03	>10	50	240	30	6 - 17	10.0
DUAL OP AMPS									
HFA1245	**$A_V \geq 1$, Low I_{CC}, CFB, Output Disable**	**0.02**	**0.03**	**50**	**530**	**1050**	**60**	**4.5 - 5.5**	**5.9**
HFA1205	**$A_V \geq 1$, Low I_{CC}, CFB**	**0.03**	**0.03**	**>50**	**400**	**1275**	**60**	**4.5 - 5.5**	**5.9**
HA5022	**$A_V \geq 1$, CFB, Output Disable**	**0.03**	**0.03**	**20**	**125**	**475**	**20**	**4.5 - 18**	**7.5**
HA5023	**$A_V \geq 1$, CFB**	**0.03**	**0.03**	**20**	**125**	**475**	**20**	**4.5 - 18**	**7.5**
TRIPLE OP AMPS									
HA5013	**$A_V \geq 1$, CFB**	**0.03**	**0.03**	**20**	**125**	**475**	**20**	**4.5 - 18**	**7.5**
QUAD OP AMPS									
HFA1405	**$A_V \geq 1$, CFB**	**0.03**	**0.03**	**TBD**	**400**	**>1000**	**60**	**4.5 - 5.5**	**5.9**
HA5024	**$A_V \geq 1$, CFB, Output Disable**	**0.03**	**0.03**	**20**	**125**	**475**	**20**	**4.5 - 18**	**7.5**
HA5025	**$A_V \geq 1$, CFB**	**0.03**	**0.03**	**20**	**125**	**475**	**20**	**4.5 - 18**	**7.5**
HA-2444	$A_V \geq 1$, 4-Channel, Mux'd Output	0.03	0.03	10	50	160	25	8.5 - 17	5
SPECIAL FUNCTION									
HA-2546	Multiplier, 2 Quad, Voltage Output	<0.1	<0.1	5	30	300	45	7 - 17	23.0
HA-2547	Multiplier, 2 Quad, Current Output	-	-	-	100	t_R = 5ns	2.0	7 - 17	20.0
HA-2556	Multiplier, 4 Quad, Voltage Output	<0.1	<0.1	10	65	420	45	5 - 17	18.0
HA-2557	Multiplier, 4 Quad, Current Output	-	-	-	100	t_R = 5ns	1.6	5 - 17	13.0
HA-2444	$A_V \geq 1$, 4-Channel, Mux'd Output	0.03	0.03	10	50	160	25	8.5 - 17	20.0
CA3256	Video Switch and Amplifier	1.0	1.0	-	25	200	16	4 - 18 (Note 1)	20

NOTES:

1. Single Supply Range.

NOTE: Bold type designates a new product from Harris.

LOW NOISE OPERATIONAL AMPLIFIERS



SINGLE		DUAL		QUAD	
HA-2539	HA-5127A	HA5022	HA-5222	HA5024	HA-5114
HA-2540	HA-5137A	HA5023	HFA1205	HA5025	HA-5134
HA-2541	HA-5147A	HA-5102	HFA1245	HA-5104	HFA1405
HA-2542	HA-5170	HA-5112			
HA-2548	HA-5177				
HA-2839	HA-5190				
HA-2840	HA-5221				
HA-5004	HFA1105				
HA-5020	HFA1106				
HA-5101	HFA1135				
HA-5111	HFA1145				

LOW NOISE: Min/Max Limits at +25°C, Unless Otherwise Specified

DEVICE	NOISE VOLTAGE 1kHz (TYP) (nV/$\sqrt{Hz}$)	NOISE CURRENT 1kHz (TYP) (pA/$\sqrt{Hz}$)	GBWP (TYP) (MHz)	SLEW RATE (TYP) (V/µs)	MINIMUM STABLE GAIN	OFFSET VOLTAGE (mV)	BIAS CURRENT (nA)	SUPPLY CURRENT (mA/OP AMP)
SINGLE OP AMPS								
HA-5004	2.2	6.0 (Note 1)	100	1200	1	5.0	5000 (Note 1)	16.0
HA-5127A	3.0	0.4	8.5	10	1	0.025	40	4.0
HA-5137A	3.0	0.4	63	20	5	0.025	40	4.0
HA-5147A	3.0	0.4	120	35	10	0.025	40	4.0
HA-5101	3.0	0.6	10	10	1	3.0	200	6
HA-5111	3.0	0.6	100	50	10	3.0	200	6
HA-5221	3.4	0.97	100	35	1	0.75	80	11.0
HA-5020	4.5	2.5 (Note 1)	100	1100	1	8.0	8000 (Note 1)	10.0
HFA1105	**3.5**	**2.5** (Note 1)	**350**	**1000**	**1**	**5.0**	**15000**	**6.1**
HFA1106	**3.5**	**2.5** (Note 1)	**315**	**700**	**1** (Note 2)	**5.0**	**15000**	**6.1**
HFA1135	**3.5**	**2.5** (Note 1)	**350**	**1200**	**1**	**5.0**	**15000**	**6.1**
HFA1145	**3.5**	**2.5** (Note 1)	**350**	**1000**	**1**	**5.0**	**15000**	**7.1**
HA-5190	6.0	5.0	150	200	5	5.0	15000	28.0
HA-2839	6.0	6.0	600	625	10	2.0	14500	15.0

NOTE: Bold type designates a new product from Harris.

LOW NOISE: Min/Max Limits at +25°C, Unless Otherwise Specified **(Continued)**

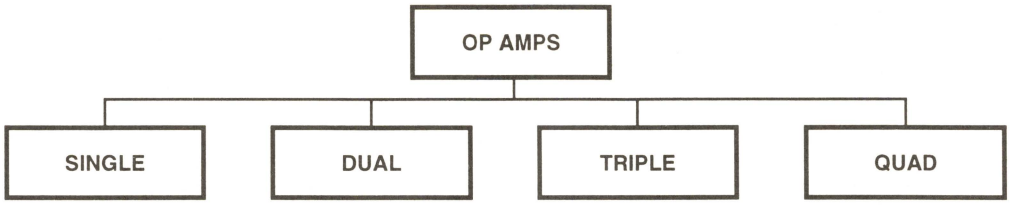
DEVICE	NOISE VOLTAGE 1kHz (TYP) (nV/√Hz)	NOISE CURRENT 1kHz (TYP) (pA/√Hz)	GBWP (TYP) (MHz)	SLEW RATE (TYP) (V/µs)	MINIMUM STABLE GAIN	OFFSET VOLTAGE (mV)	BIAS CURRENT (nA)	SUPPLY CURRENT (mA/OP AMP)
HA-2840	6.0	6.0	600	625	10	2.0	14500	15.0
HA-2539	6.0	6.0	600	600	10	10.0	20000	25.0
HA-2540	6.0	6.0	400	400	10	10.0	20000	25.0
HA-2548	8.3	0.4	150	110	5 (Note 2)	0.9	50	18.0
HA-5177	9	1.2	2.0	0.8	1	0.06	6	1.7
HA-5170	10.0	0.01	8.0	8.0	1	0.3	0.1	2.5
HA-2542	10.0	3.0	70	350	2 (Note 2)	10.0	35000	34.5
HA-2541	10.0	4.0	40	250	1	2.0	35000	40.0
DUAL OP AMPS								
HA-5222	3.4	0.97	100	35	1	0.75	80	11.0
HFA1205	**3.5**	**2.5** (Note 1)	**400**	**1275**	**1**	**5.0**	**15000**	**6.1**
HFA1245	**3.5**	**2.5** (Note 1)	**530**	**1050**	**1**	**5.0**	**15000**	**6.1**
HA-5102	4.3	0.57	8.0	3.0	1	2.0	200	2.5
HA-5112	4.3	0.57	60	20	10	2.0	200	2.5
HA5022	**4.5**	**2.5** (Note 1)	**125**	**475**	**1**	**3.0**	**8000** (Note 1)	**10**
HA5023	**4.5**	**2.5** (Note 1)	**125**	**475**	**1**	**3.0**	**8000** (Note 1)	**10**
QUAD OP AMPS								
HFA1405	**3.5**	**2.5** (Note 1)	**400**	**>1000**	**1**	**5.0**	**15000**	**6.1**
HA-5104	4.3	0.57	8.0	3.0	1	2.5	200	1.63
HA-5114	4.3	0.57	60	20	10	2.5	200	1.63
HA5024	**4.5**	**2.5** (Note 1)	**125**	**475**	**1**	**3.0**	**8000** (Note 1)	**10**
HA5025	**4.5**	**2.5** (Note 1)	**125**	**475**	**1**	**3.0**	**8000** (Note 1)	**10**
HA-5134	7.0	1.0	4.0	1.0	1	0.2	50	2.0

NOTES:

1. +Input. These are current feedback amplifiers, so value for -Input will be larger.
2. Product features an external compensation pin to limit bandwidth for additional noise reduction or to allow unity gain operation.

NOTE: Bold type designates a new product from Harris.

GENERAL PUPOSE OPERATIONAL AMPLIFIERS



CA741 HA-2544
CA3080 HA-2548
CA3100 HA-2600
CA3130A HA-2620
CA3140A HA-2640
CA3160A HA-5101
CA3193A HA-5111
CA5130A HA-5127A
CA5160A HA-5137A
HA2500 HA-5147A
HA2510 HA-5170
HA-2520 HA-5195
HA-2529

CA158A CA3280A
CA1558 CA5260A
CA3240A HA-5102
CA3260A HA-5112

CA3060

CA124 HA-5104
CA5470 HA-5114
HA4741

GENERAL PURPOSE: Typical Values at +25°C, Unless Otherwise Specified

DEVICE	DESCRIPTION	MINIMUM STABLE GAIN	GBWP (MHz)	SLEW RATE (V/μs)	OFFSET VOLTAGE (mV)	BIAS CURRENT (μA)	SUPPLY VOLTAGE RANGE (±V)	SUPPLY CURRENT (mA/OP AMP)
SINGLE OP AMPS								
HA-2544	Ultra-Stable, High Performance	1	50	150	6.0	7.00	8-17.5	10.0
CA3100	Wideband Amplifier	1	38	70	1.0	0.7	7-18	8.5
CA3130A	BiMOS, CMOS Output, Output Strobe	1	15	30	2.0	5.0pA	2.5-8	2.0
HA2500	Wideband, High Slew Rate, High Input Impedance	1	12	30	2.0	0.1	10-20	4
HA2510	Wideband, High Slew Rate, High Input Impedance	1	12	60	4.0	0.1	10-20	4
CA5130A	Mil Temp Version of CA3130A	1	15	30	2.0	5.0pA	2.5-8	2.0
HA-2600	Wideband, Compensated, High Input Impedance	1	12	7	0.5	0.001	4-22.5	3.0
HA-5101	Low Noise, High Performance	1	10	10	0.5	0.1	3-20	4.0
HA-5127A	Low Noise, Precision, Compensated	1	8.5	10	0.01	0.01	5-22	3.5
HA-5170	JFET Input, Precision	1	8	8	0.1	20pA	5-22	1.9
CA3140A	BiMOS, Output Strobe Capability	1	4.5	9	2.0	10.0pA	2-18	4.0
HA-2640	High Voltage, Compensated	1	4	5	2.0	0.01	10-50	3.2
CA3160A	BiMOS, CMOS Output, Output Strobe	1	4	10	2.0	5.0pA	2.5-8	2.0
CA5160A	Mil Temp Version of CA3160A	1	4	10	2.0	5.0pA	2.5-8	2.0
CA3080	Operational Transconductance Amp	1	2	75	0.4	2.0	2-18	1.0

NOTE: Bold type designates a new product from Harris.

GENERAL PURPOSE: Typical Values at +25°C, Unless Otherwise Specified **(Continued)**

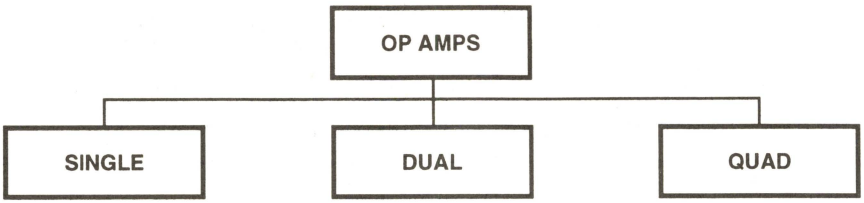
DEVICE	DESCRIPTION	MINIMUM STABLE GAIN	GBWP (MHz)	SLEW RATE (V/μs)	OFFSET VOLTAGE (mV)	BIAS CURRENT (μA)	SUPPLY VOLTAGE RANGE (±V)	SUPPLY CURRENT (mA/OP AMP)
CA3193A	BiMOS, Instrumentation Amplifier	1	1.2	0.25	0.14	0.01	3.5-18	2.3
CA741	Low Cost	1	1	0.5	1.0	0.08	5-22	1.7
HA-2520	Uncompensated	3 (Note 1)	20	120	5.0	0.125	10-20	4.0
HA-2529	Uncompensated, High Output Current	3 (Note 1)	20	150	2.0	0.05	6-20	4.5
HA-5137A	Low Noise, Precision	5	80	20	0.01	0.01	5-22	3.5
HA-2620	Wideband, Uncompensated, High Input Impedance	5 (Note 1)	100	35	0.5	0.001	4-22.5	3.0
HA-5195	Wideband, Fast Settling	5	150	200	3.0	5.0	12-17.5	19.0
HA-2548	Wideband, Precision	5 (Note 1)	150	110	0.3	0.005	8-20	12.0
HA-5147A	Low Noise, Precision, Wideband	10	140	35	0.01	0.01	5-22	3.5
HA-5111	Low Noise, High Performance, Uncompensated	10 (Note 1)	100	50	0.5	0.1	3-20	4.0
DUAL								
CA3280A	Operational Transconductance Amp	1	9	125	0.25	1.8	2-18	2.0
HA-5102	Low Noise, High Performance	1	8	3	0.5	0.13	3-20	1.5
CA3240A	BiMOS, High Input Impedance	1	4.5	9	2.0	10.0pA	2-18	4.0
CA3260A	BiMOS, CMOS Output, High Input Impedance	1	4	10	2.0	5.0pA	2-8	0.6
CA5260A	Mil Temp Version of CA3260A	1	3	5	2.0	5.0pA	2.25-8	0.6
CA158A	Wide Supply Range	1	1	0.25	1.0	0.02	1.5-16	0.75
CA1558	Low Cost	1	1	0.5	1.0	0.08	5-22	1.7
HA-5112	Low Noise, High Performance, Uncompensated	10	60	20	0.5	0.13	3-20	1.5
TRIPLE								
CA3060	Operational Transconductance Amp	1	0.11	8.0	1.0	2.5	6-18	0.85
QUAD								
CA5470	High Input Impedance, Wide Supply Range	1	14	5	5.0	1.0pA	1.5-8	2.5
HA-5104	Low Noise, High Performance	1	8	3	0.5	0.13	3-20	1.25
CA124	Wide Supply Range	1	1	0.5	2.0	0.045	2.5-16	0.2
HA-4741	Quad 741, Wide Supply	1	3.5	1.6	0.5	0.06	2-20	4.5
HA-5114	Low Noise, High Performance, Uncompensated	10	60	20	0.5	0.13	3-20	1.25

NOTE:

1. Can be compensated to unity gain.

NOTE: Bold type designates a new product from Harris.

PRECISION OPERATIONAL AMPLIFIERS



SINGLE		DUAL		QUAD	
CA3193A	HA-5147A	CA158A	HA-5112	CA124	HA-5104
HA-2548	HA-5147	CA258A	HA-5142	CA224	HA-5114
HA-5127A	HA-5170	CA358A	HA-5222	CA324	HA5134
HA-5130	HA-5177	CA3280A	ICL7621A	CA2902	HA-5144
HA-5135	HA-5221	HA-5102			
HA-5137	ICL7650S				
HA-5137A					

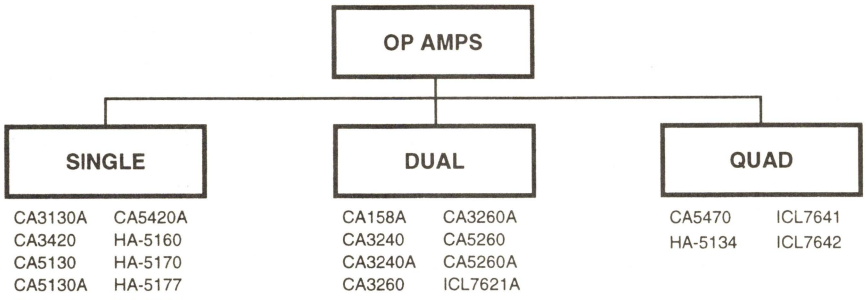
PRECISION: Min/Max Limits at +25°C, Unless Otherwise Specified

DEVICE	OFFSET VOLTAGE (mV)	V_{IO} DRIFT (TYP) (µV/°C)	BIAS CURRENT (nA)	OFFSET CURRENT (nA)	CMRR (dB)	PSRR (dB)	GBWP (TYP) (MHz)	SLEW RATE (TYP) (V/µs)	A_{VOL} (dB)	SUPPLY CURRENT (mA/OP AMP)
SINGLE OP AMPS										
ICL7650S	0.005	0.02	0.01	0.02	120	120	2.0	2.5	135	3.0
HA-5127A	0.025	0.20	40.0	35.0	114	108	8.5	10.0	120	4.0
HA-5130	0.025	0.40	2.0	2.0	110	100	2.5	0.8	120	1.7
HA-5137A	0.025	0.20	40.0	35.0	114	108	63.0	20.0	120	4.0
HA-5147A	0.025	0.20	40.0	35.0	114	108	120.0	35.0	120	4.0
HA-5177	0.060	0.20	6.0	6.0	110	110	2.0	0.8	126	1.7
HA-5135	0.075	0.40	4.0	4.0	106	94	2.5	0.8	120	1.7
HA-5137	0.100	0.40	80.0	75.0	100	96	63.0	20.0	117	4.0
HA-5147	0.100	0.40	80.0	75.0	100	96	120.0	35.0	117	4.0
CA3193A	0.200	1.00	20.0	5.0	110	100	1.2	0.25	110	3.5
HA-5170	0.300	2.0	0.1	0.03	85	85	8.0	8.0	109	2.5
HA-2548	0.900	4.0	50.0	50.0	80	86	150.0	110.0	114	18.0
HA-5221	0.750	0.5	80.0	50.0	86	86	100.0	35.0	106	11.0
DUAL OP AMPS										
HA-5222	0.75	0.5	80	50	86	86	100.0	35.0	106	11.0
CA158A	2.0	7.0	50	10	70	65	1.0	0.5	94	1.5
HA-5102	2.0	3.0	200	75	86	86	8.0	3.0	100	2.5
HA-5112	2.0	3.0	200	75	86	86	60.0	20.0	100	2.5
ICL7621A	2.0	10.0	0.05	0.03	76	80	0.5	0.16	86	0.25
CA3280A	0.5	3.0	5000	700	94	94	9.0	125.0	94	2.4

PRECISION: Min/Max Limits at +25°C, Unless Otherwise Specified **(Continued)**

DEVICE	OFFSET VOLTAGE (mV)	V_{IO} DRIFT (TYP) (μV/°C)	BIAS CURRENT (nA)	OFFSET CURRENT (nA)	CMRR (dB)	PSRR (dB)	GBWP (TYP) (MHz)	SLEW RATE (TYP) (V/μs)	A_{VOL} (dB)	SUPPLY CURRENT (mA/OP AMP)
CA258A	3.0	7.0	80	15	70	65	1.0	0.5	94	1.5
CA358A	3.0	7.0	100	30	65	65	1.0	0.5	88	1.5
HA-5142	6.0	3.0	100.0	10.0	77	77	0.4	1.5	86	0.15
QUAD OP AMPS										
HA-5134	0.2	0.3	50.0	50.0	100	100	4.0	1.0	118	2.0
HA-5114	2.5	3.0	200.0	75.0	86	86	60.0	20.0	100	1.63
HA-5104	2.5	3.0	200.0	75.0	86	86	8.0	3.0	100	1.63
CA124	5.0	7.0	150.0	30.0	70	65	1.0	0.5	94	0.5
HA-5144	6.0	3.0	100.0	10.0	77	77	0.4	1.5	86	0.15
CA224	7.0	7.0	250.0	50.0	65	65	1.0	0.5	88	0.5
CA324	7.0	7.0	250.0	50.0	65	65	1.0	0.5	86	0.5
CA2902	7.0	7.0	250.0	50.0	65	65	1.0	0.5	86	0.3

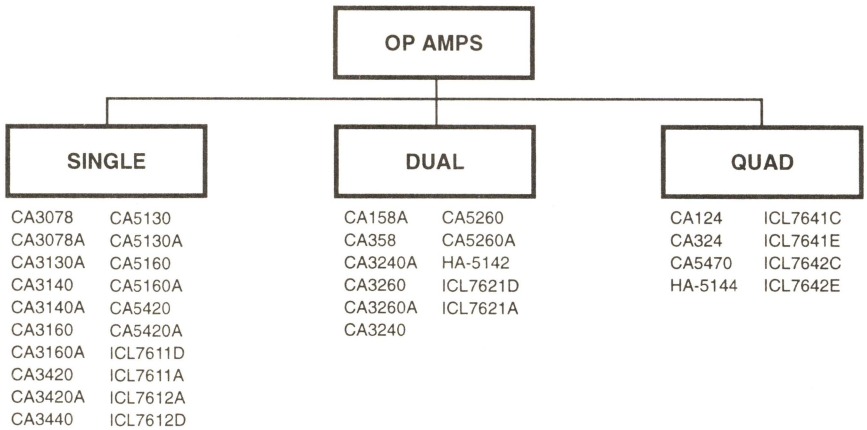
LOW BIAS CURRENT OPERATIONAL AMPLIFIERS



LOW BIAS CURRENT: Min/Max Limits at +25°C, Unless Otherwise Specified

DEVICE	BIAS CURRENT (nA)	OFFSET CURRENT (nA)	OFFSET VOLTAGE (mV)	CM RANGE AT NOMINAL SUPPLIES (V)	A_{VOL} (dB)	GBWP (TYP) (MHz)	SLEW RATE (TYP) (V/µs)	CMRR (dB)	PSRR (dB)	SUPPLY CURRENT (mA/OP AMP)
SINGLE OP AMPS										
CA5420A	0.001	0.0005	5.0	-0 to +3.7 at +5, -0	85	0.5	0.5	75	75	0.50
CA5420	0.002	0.001	10.0	-0 to +3.7 at +5, -0	85	0.5	0.5	70	70	0.50
CA3420	0.005	0.004	10.0	-10 to +8.5 at +10, -10	80	0.5	0.5	70	70	1.0
CA3420A	0.005	0.004	5.0	-10 to +9 at +10, -10	86	0.5	0.5	70	70	1.0
CA5130A	0.01	0.005	4.0	-0 to +2.5 at +5, -0	90	15.0	30.0	75	60	0.10
CA5160A	0.01	0.005	4.0	-0 to +2.5 at +5, -0	90	4.0	10.0	75	60	0.10
ICL7650S	0.01	0.02	0.005	-5 to +3.5 at +5, -5	135	2.0	2.5	120	120	3.00
CA5130	0.015	0.01	10.0	-0 to +2.5 at +5, -0	85	15.0	30.0	70	55	0.10
CA5160	0.015	0.01	10.0	-0 to +2.5 at +5, -0	85	4.0	10.0	70	55	0.10
CA3130A	0.03	0.02	5.0	-0 to +10.0 at +15, -0	94	15.0	30.0	80	76	15.00
HA-5160	0.05	0.01	3.0	-10.0 to +10.0 at +15, -15	98	100.0	120	74	74	10.0
HA-5170	0.10	0.03	0.3	-10.0 to +10.0 at +15, -15	110	8.0	8.0	90	90	2.50
DUAL OP AMPS										
CA5260	0.015	0.01	15.0	-0 to +2.5 at +5, -0	80	3.0	5.0	70	70	1.0
CA5260A	0.015	0.01	4.0	-0 to +2.5 at +5, -0	83	3.0	5.0	80	75	1.0
CA3260A	0.03	0.02	5.0	-0 to +10.0 at +15, -0	94	4.0	10.0	80	76	1.5
CA3240A	0.04	0.02	5.0	-15 to +12.0 at +15, -15	86	4.5	9.0	70	76	6.0
CA3240	0.05	0.03	15.0	-15 to +11.0 at +15, -15	86	4.5	9.0	70	76	6.0
CA3260	0.05	0.03	15.0	-0 to +10.0 at +15, -0	94	4.0	10.0	70	70	1.5
ICL7621A	0.05	0.03	2.0	-4.2 to +4.2 at +5, -5	86	0.5	0.16	76	80	0.25
CA158A	50.0	10.0	2.0	-15 to +13.5 at +15, -15	94	1.0	0.5	70	65	1.50
QUAD OP AMPS										
CA5470	0.05	0.05	25.0	-0 to +3.5 at +5, -0	80	14.0	5.0	55	60	3.0
ICL7641	0.05	0.03	10.0	-3.7 to +3.7 at +5, -5	76	1.4	1.6	60	70	2.5
ICL7642	0.05	0.03	10.0	-4.4 to +4.4 at +5, -5	80	0.04	0.02	70	80	0.03
HA-5134	50.0	50.0	0.2	-10 to +10 at +15, -15	118	4.0	1.0	100	100	2.0

5V SINGLE-SUPPLY OPERATIONAL AMPLIFIERS



5V SINGLE-SUPPLY: Min/Max Limits at +25°C, Unless Otherwise Specified

DEVICE	SUPPLY CURRENT (TYP) (mA/OP AMP)	INPUT OFFSET VOLTAGE (mV)	DOES INPUT INCLUDE GROUND?	RAIL-TO-RAIL OUTPUT?	INPUT BIAS CURRENT (nA)	GAIN BANDWIDTH PRODUCT (TYP) (MHz)	SLEW RATE (TYP) (V/µs)	MINIMUM SINGLE SUPPLY VOLTAGE (V)	OUTPUT SHORT CIRCUIT CURRENT (TYP) (mA) SOURCE = + SINK = - SUPPLY AT 5V, 0V
SINGLE OP AMPS									
CA3440 (Note 1)	0.005	10	Yes	No	0.05	0.063	0.03	5.0	+3.9, -2.5
ICL7612A	0.01	2	Yes	Yes	0.05	0.04	0.016	2.0	+12.5, -0.8
ICL7611A	0.01	2	No	Yes	0.05	0.04	0.016	2.0	+12.5, -0.8
ICL7612D	0.01	15	Yes	Yes	0.05	0.04	0.016	2.0	+12.5, -0.8
ICL7611D	0.01	15	No	Yes	0.05	0.04	0.016	2.0	+12.5, -0.8
CA3078A (Note 1)	0.025	3.5	No	No	12	1.5	0.5	1.5	+12.0, -12.0
CA5160A	0.05	4	Yes	Yes	0.01	4	10	5.0	+3.1, -1.6
CA5130A	0.05	4	Yes	Yes	0.01	4	10	4.0	+3.1, -1.4
CA5160	0.05	10	Yes	Yes	0.015	4	10	5.0	+3.4, -2.2
CA5130	0.05	10	Yes	Yes	0.015	4	10	4.0	+2.6, -1.7
CA3078 (Note 1)	0.130	4.5	No	No	170	8	1.5	1.5	+12.0, -12.0
CA3130A (Note 1)	0.30	5	Yes	Yes	0.03	15	10	5.0	+3.2, -2.2
CA3130 (Note 1)	0.30	15	Yes	Yes	0.05	15	10	5.0	+3.2, -2.2
CA3160A (Note 1)	0.30	5	Yes	Yes	0.03	4	10	5.0	+3.2, -2.2
CA3160 (Note 1)	0.30	15	Yes	Yes	0.05	4	10	5.0	+3.2, -2.2

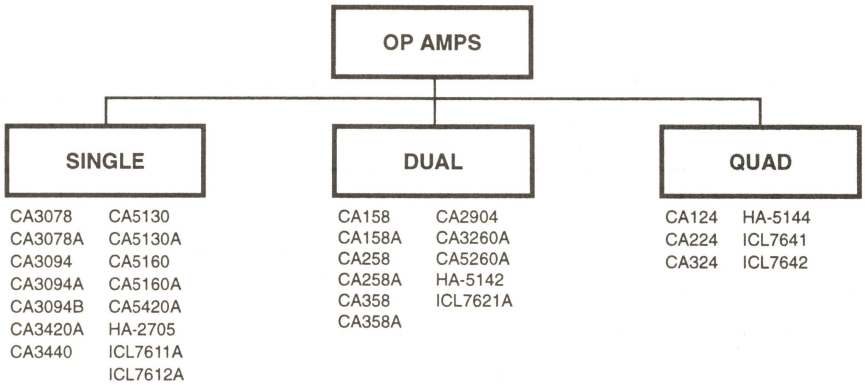
5V SINGLE-SUPPLY: Min/Max Limits at +25°C, Unless Otherwise Specified **(Continued)**

DEVICE	SUPPLY CURRENT (TYP) (mA/OP AMP)	INPUT OFFSET VOLTAGE (mV)	DOES INPUT INCLUDE GROUND?	RAIL-TO-RAIL OUTPUT?	INPUT BIAS CURRENT (nA)	GAIN BANDWIDTH PRODUCT (TYP) (MHz)	SLEW RATE (TYP) (V/μs)	MINIMUM SINGLE SUPPLY VOLTAGE (V)	OUTPUT SHORT CIRCUIT CURRENT (TYP) (mA) SOURCE = + SINK = - SUPPLY AT 5V, 0V
CA5420A	0.40	5	Yes	Yes	0.001	0.5	0.5	2.0	+2.6, -2.4
CA5420	0.40	10	Yes	Yes	0.002	0.5	0.5	2.0	+2.6, -2.4
CA3420A	0.45	5	Yes	Yes	0.005	0.5	0.5	2.0	+2.6, -2.4
CA3420	0.45	10	Yes	Yes	0.005	0.5	0.5	2.0	+2.6, -2.4
CA3140A (Note 1)	1.60	5	Yes	No	0.04	3.7	9	4.0	+10.0, -1.0
CA3140 (Note 1)	1.60	15	Yes	No	0.05	3.7	9	4.0	+10.0, -1.0
DUAL OP AMPS									
HA-5142	0.05	6	Yes	No	100	0.4	1.5	3.0	+4.5, -4.5
ICL7621A (Note 1)	0.10	2	No	Yes	0.05	0.5	0.16	2.0	+12.5, -0.4
ICL7621D (Note 1)	0.10	15	No	Yes	0.05	0.5	0.16	2.0	+12.5, -0.4
CA158A	0.35	3	Yes	No	100	1	0.5	3.0	+40, -20
CA358	0.35	7	Yes	No	250	1	0.5	3.0	+40, -20
CA3260A (Note 1)	0.60	5	Yes	Yes	0.03	4	10	4.0	+3.2, -2.2
CA3260 (Note 1)	0.60	15	Yes	Yes	0.05	4	10	4.0	+3.2, -2.2
CA5260A	0.80	4	Yes	Yes	0.015	3	5	4.5	+2.2, -2.0
CA5260	0.80	15	Yes	Yes	0.015	3	5	4.5	+2.2, -2.0
CA3240A (Note 1)	2.00	5	Yes	No	0.04	3.7	9	5.0	+20.0, -1.0
CA3240 (Note 1)	2.00	15	Yes	No	0.05	3.7	9	5.0	+20.0, -1.0
QUAD OP AMPS									
ICL7642C	0.01	10	No	Yes	0.05	0.044	0.016	2.0	+10.0, -0.05
ICL7642E	0.01	20	No	Yes	0.05	0.044	0.016	2.0	+12.5, -0.05
HA-5144	0.05	6	Yes	No	100	0.4	1.5	3.0	+4.5, -4.5
CA324	0.20	7	Yes	No	250	1	0.5	5.0	+40, -20
CA124	0.20	5	Yes	No	150	1	0.5	5.0	+40, -20
ICL7641C (Note 1)	1.00	10	No	Yes	0.05	1.4	1.6	5.0	+12.5, -0.8
ICL7641E (Note 1)	1.00	20	No	Yes	0.05	1.4	1.6	5.0	+12.5, -0.8
CA5470	1.50	22	Yes	No	0.05	14	5	3.0	+5.5, -1.2

NOTES:

1. Limits are for single 5V operation if data is available in datasheet.
2. Supply Current for single 5V supply, if specified in datasheet.

LOW POWER OPERATIONAL AMPLIFIERS



LOW POWER: Min/Max Limits at +25°C, Unless Otherwise Specified (Note 1)

DEVICE	SUPPLY CURRENT (mA/OP AMP)	SUPPLY VOLTAGE RANGE (±V)	SLEW RATE (TYP) (V/µs)	GBWP (TYP) (MHz)	CM RANGE AT NOMINAL SUPPLY (V)	OUTPUT VOLTAGE SWING (V)	OUTPUT SHORT CIRCUIT CURRENT (TYP) (mA) SOURCE = + SINK = -	OFFSET VOLTAGE (mV)	BIAS CURRENT (nA)	PSRR (dB)
SINGLE OP AMPS										
CA3440	0.017	2.5-12.5	0.03	0.063	-5.0 to +3.5 at +5, -5	±3.0	+15, -4.5	10.0	0.050	70
CA3078A	0.02	0.75-18	0.5	1.5	-5 to +5 at +6, -6	±5.1	±12.0	3.5	12.0	70
ICL7611A	0.02	1.0-9.0	0.02	0.044	-4.4 to +4.4 at +5, -5	±4.9	+25.0, -7.0	2.0	0.05	80
ICL7612A	0.02	1.0-9.0	0.02	0.044	-5.3 to +5.3 at +5, -5	±4.9	+25.0, -7.0	2.0	0.05	80
CA5130	0.10	2.5-8.0	10.0	4.0	-0 to +2.5 at +5, -0	+4.99, +0.01	+2.6, -1.7	10.0	0.015	55
CA5130A	0.10	2.5-8.0	10.0	4.0	-0 to +2.5 at +5, -0	+4.99, +0.01	+3.1, -1.4	4.0	0.010	60
CA5160	0.10	2.5-8.0	10.0	4.0	-0 to +2.5 at +5, -0	+4.99, +0.01	+3.4, -2.2	10.0	0.015	55
CA5160A	0.10	2.5-8.0	10.0	4.0	-0 to +2.5 at +5, -0	+4.99, +0.01	+3.1, -1.6	4.0	0.010	60
CA3078	0.13	0.75-7.0	1.5	8.0	-5 to +5 at +6, -6	±5.1	±12.0	4.5	170.0	70
HA-2705	0.15	5.5-22.0	20	1.0	-11 to +11 at +15, -15	±12	±10.0	5.0	40	80
CA3094	0.40	3.0-12.0	50.0	30.0	-14 to +12 at +15, -15	±14.9	±100.0	5.0	5000.0	70
CA3094A	0.40	3.0-18.0	50.0	30.0	-14 to +12 at +15, -15	±14.9	±100.0	5.0	5000.0	70
CA3094B	0.40	3.0-22.0	50.0	30.0	-14 to +12 at +15, -15	±14.9	±100.0	5.0	5000.0	70
CA5420A	0.55	1.0-11.0	0.5	0.5	-0 to +3.7 at +5, -0	+4.9, +0.15	+2.6, -2.4	5.0	0.005	70
CA3420A	1.0	1.0-11.0	0.5	0.5	-10 to +9 at +10, -10	±9.7	+2.6, -2.4	5.0	0.005	70
DUAL OP AMPS										
HA-5142	0.15	1.5-17.5	1.5	0.4	-0 to +3.0 at +5, -0	+3.8, +1.0	+4.5, -4.5	6.0	100	77
ICL7621A	0.25	1.0-9.0	0.16	0.5	-4.2 to +4.2 at +5, -5	±4.9	+15.0, -0.9	2.0	0.05	80

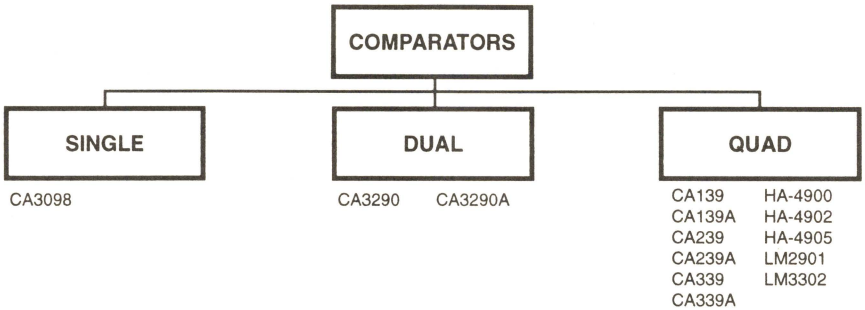
LOW POWER: Min/Max Limits at +25°C, Unless Otherwise Specified (Note 1) **(Continued)**

DEVICE	SUPPLY CURRENT (mA/OP AMP)	SUPPLY VOLTAGE RANGE (±V)	SLEW RATE (TYP) (V/µs)	GBWP (TYP) (MHz)	CM RANGE AT NOMINAL SUPPLY (V)	OUTPUT VOLTAGE SWING (V)	OUTPUT SHORT CIRCUIT CURRENT (TYP) (mA) SOURCE = + SINK = -	OFFSET VOLTAGE (mV)	BIAS CURRENT (nA)	PSRR (dB)
CA158A	1.5	1.5-16.0	0.5	1.0	-15 to +13.5 at +15, -15	+13.5, -15.0	+40.0, -20	2.0	50.0	65
CA258A	1.5	1.5-16.0	0.5	1.0	-15 to +13.5 at +15, -15	+13.5, -15.0	+40.0, -20	3.0	80.0	65
CA2904	1.5	1.5-13.0	0.5	1.0	-15 to +13.5 at +15, -15	+13.5, -15.0	+40.0, -20	7.0	250.0	50
CA258	1.5	1.5-16.0	0.5	1.0	-15 to +13.5 at +15, -15	+13.5, -15.0	+40.0, -20	5.0	150.0	65
CA358	1.5	1.5-16.0	0.5	1.0	-15 to +13.5 at +15, -15	+13.5, -15.0	+40.0, -20	7.0	250.0	65
CA158	1.5	1.5-16.0	0.5	1.0	-15 to +13.5 at +15, -15	+13.5, -15.0	+40.0, -20	5.0	150.0	65
CA358A	1.5	1.5-16.0	0.5	1.0	-15 to +13.5 at +15, -15	+13.5, -15.0	+40.0, -20	3.0	100.0	65
CA3260A	1.5	2.0-8.0	10	4	-0 to +10 at +15, -0	+14.99, +0.01	+22.0, -20	5.0	0.03	77
CA5260A	2.0	2.25-8.0	5.0	3.0	-0 to +2.5 at +5, -0	+4.99, +0.01	+2.2, -2.0	5.0	0.030	76
QUAD OP AMPS										
ICL7642	0.02	1.0-9.0	0.02	0.04	-4.4 to +4.4 at +5, -5	±4.5	+10, -0.08	10.0	0.05	80
HA-5144	0.15	1.5-17.5	1.5	0.4	-0 to +3 at +5, -0	+3.8, +1.0	+4.5, -4.5	6.0	100.0	77
CA124	0.5	2.5-16.0	0.5	1.0	-15 to +13.5 at +15, -15	+13.5, -15	+40.0, -20	5.0	150.0	65
CA224	0.5	2.5-16.0	0.5	1.0	-15 to +13.5 at +15, -15	+13.5, -15	+40.0, -20	7.0	250.0	65
CA324	0.5	2.5-16.0	0.5	1.0	-15 to +13.5 at +15, -15	+13.5, -15	+40.0, -20	7.0	250.0	65
ICL7641	2.50	1.5-9.0	1.6	1.4	-3.7 to +3.7 at +5, -5	±4.5	+25, -7.0	10.0	0.05	80

NOTE:

1. See "CM Range" column for the Nominal Supply Voltage at which these specifications apply.

COMPARATORS



COMPARATORS: General Purpose Electrical Characteristics, $T_A = +25^oC$

TYPE	V_{IO} MAX (mV)	INPUT CURRENT MAX (nA)	SUPPLY CURRENT MAX (mA)	SUPPLY VOLTAGE RANGE V+, V- TYP (V)	A_{OL} MIN (dB)	RESPONSE TIME TYP (ns)	(NOTE 1) LEAD COUNT AND PACKAGE TYPE	COMMENTS
SINGLE UNIT TYPE								
CA3098	15	100	0.8	+5, -0 to +8, -8	-	900	8PDIP	Dual Input Level Detector with Schmitt Trigger
DUAL UNIT TYPES								
CA3290	20	50pA	3	+5, -0 to +18, -18	88	T_R = 1200 T_F = 200	8PDIP, 14PDIP, 8T05	
CA3290A	10	40pA	3	+5, -0 to +18, -18	88		8PDIP, 14PDIP, 8T05	
QUAD UNIT TYPES								
CA139	5	100	8	+2.5, -0 to +18, -18	-	T_R = 1300 T_F = 750	14PDIP, 14CerDIP, 14SOIC	
CA139A	2	100	8	+2.5, -0 to +18, -18	94		14PDIP, 14CerDIP, 14SOIC	
CA239	5	250	2	+2.5, -0 to +18, -18	-		14PDIP, 14CerDIP, 14SOIC	
CA239A	2	250	2	+2.5, -0 to +18, -18	94		14PDIP, 14CerDIP, 14SOIC	
CA339	5	250	2	+2.5, -0 to +18, -18	-		14PDIP, 14CerDIP, 14SOIC	
CA339A	2	250	2	+2.5, -0 to +18, -18	94		14PDIP, 14SOIC	
LM2901	7	250	2	+2.5, -0 to +18, -18	-		14SOIC, 14PDIP	
LM3302	20	500	2	+2.5, -0 to +18, -18	-		14SOIC, 14PDIP	
HA-4900	2	75	+20, -8, +4 (Note 2)	+5, -0 to +16.5, -16.5	112	130	16CerDIP	Single or Dual Supply. Analog and Logic Supplies Separated for Easier Interface and Noise Immunity
HA-4902	2	150	+20, -8, +4 (Note 2)	+5, -0 to +16.5, -16.5	112	130	16CerDIP	
HA-4905	4	150	+20, -8, +4 (Note 2)	+5, -0 to +16.5, -16.5	112	130	16PDIP, 16CerDIP, 16SOIC (300 mil), 20PLCC	

NOTE:

1. See Linear Package Selection Guide.
2. Positive Supply Current, Negative Supply Current, Logic Supply Current.

SAMPLE AND HOLD AMPLIFIERS: Typical Values at +25°C, Unless Otherwise Specified

TYPE	SAMPLE/HOLD TYPE	TEMPERATURE RANGE	(NOTE 1) PACKAGE	ACQUISITION TIME (TO 0.01%)	HOLD STEP ERROR	APERTURE TIME	GAIN BANDWIDTH PRODUCT
HA1-2420-2	External Hold Cap Low Cost	-55°C to +125°C	14CerDIP	3.2µs	10mV	30ns	2.5MHz (C_H = 1000pF)
HA1-2425-5		0°C to +75°C	14CerDIP				
HA3-2425-5		0°C to +75°C	14PDIP				
HA4P-2425-5		0°C to +75°C	20PLCC				
HA9P-2425-5		0°C to +75°C	14SOIC				
HA1-5320-2	High Speed, Low Charge, Transfer Precision, Complete - Includes Hold Capacitor	-55°C to +125°C	14CerDIP	1µs (C_H = Internal)	1mV	25ns	2.0MHz (C_H = 100pF)
HA1-5320-5		0°C to +75°C	14CerDIP				
HA1-5320/883		-55°C to +125°C	14CerDIP				
HA3-5320-5		0°C to +75°C	14PDIP				
HA4-5320/883		-55°C to +125°C	20LCC Ceramic				
HA9P5320-5		0°C to +75°C	16SOIC (300 mil)				
HA9P5320-9		-40°C to +85°C	16SOIC (300 mil)				
HA1-5330-5	Very High Speed, Precision, Monolithic, Complete - Includes Hold Capacitor	0°C to +75°C	14CerDIP	650ns	0.5mV	20ns	4.5MHz
HA1-5330-4		-25°C to +85°C	14CerDIP				
HA1-5330-2		-55°C to +125°C	14CerDIP				
HA1-5330/883		-55°C to +125°C	14CerDIP				
HA3-5330-5		0°C to +75°C	14PDIP				
HA4-5330/883		-55°C to +125°C	20LCC Ceramic				
HA1-5340-5	High Speed, Low Distortion Includes Hold Capacitor	0°C to +75°C	14CerDIP	700ns	15mV	15ns	10MHz
HA1-5340-9		-40°C to +85°C	14CerDIP				
HA1-5340/883		-55°C to +125°C	14CerDIP				
HA3-5340-5		0°C to +75°C	14PDIP				
HA3-5340-9		-40°C to +85°C	14PDIP				
HA4-5340/883		-55°C to +125°C	20LCC Ceramic				
HA9P5340-5		0°C to +75°C	16SOIC (300 mil)				
HA5351IP	Ultra High Speed and Low Power, Includes Hold Capacitor, Low Pin Count	-40°C to +85°C	8PDIP	64ns	5mV	10ns	40MHz
HA5351IB		-40°C to +85°C	8SOIC				
HA5352IP	Dual, Ultra High Speed and Low Power, Includes Hold Capacitor	-40°C to +85°C	14PDIP	64ns	5mV	10ns	40MHz
HA5352IB		-40°C to +85°C	16SOIC (300 mil)				

NOTE:

1. See Linear Package Selection Guide.

DIFFERENTIAL AMPLIFIERS: Typical Values, Unless Otherwise Specified

TYPE	DESCRIPTION	(NOTE 4) FEATURES	FREQ. RANGE DC TO (MHz)	VOLTAGE GAIN (dB)	BW (3dB POINT) (MHz)	1/F NF (dB)	AGC RANGE (dB)	(NOTE 5) LEAD CT AND PKG TYPE
CA3028A	Differential/ Cascode Amplifiers	• Balanced Differential Amplifier Configuration with Controlled Constant Current Source • RF, IF and Video Frequency Capability • Balanced AGC Capability • Operation from DC to 500MHz • CA3028B is Controlled for Input Offset Voltage, Current, and Input Bias Current, and is Intended for "Balance" Requirements • Push-Pull Inputs and Outputs • CA3028 and CA3053 are Identical Except for 100MHz Noise Specification	120	40 (Note 1)	-	7.2	62	8PDIP, 8SOIC, 8TO5
CA3028B			120	40	8	7.2	62	
CA3049	Dual High Frequency		500	22	1.35 (Note 2)	4.6	75	12TO5
CA3053	Differential/Cascode Amplifier		120	40	Recommended for IF Amplifier Applications			8PDIP, 8SOIC, 8TO5
CA3054	Dual Independent		120	32	550 (Note 3)	3.25	75	14PDIP, 14SOIC
CA3102	Dual High Frequency		500	22	1.35 (Note 2)	4.6	75	14PDIP, 14SOIC

NOTES:

1. Power Gain (G_P) Min. at 100MHz: Cascode = 16dB; Differential Amplifier = 14dB.
2. GHz.
3. f_T (MHz).
4. T_A Range: -55°C to +125°C except for type CA3054 (0°C to +85°C).
5. See Linear Package Selection Guide.

TRANSISTOR ARRAYS: Electrical Characteristics T_A = +25°C

TYPE	DESCRIPTION	$V_{(BR)\ CEO}$ (MIN) V	$V_{(BR)\ CBO}$ (MIN) V	h_{FE} (MIN)	I_C (MAX) mA	(NOTE 1) LEAD COUNT AND PACKAGE TYPE
CA3018	Two Isolated Transistors Plus a Darlington Pair	15	20	30	50	12TO5
CA3018A		15	30	60	50	
		h_{FE} matched ±10%. V_{BE} matched ±2mV and ±5mV Max Operation from DC to 120MHz				
CA3045	Three Transistors Plus a Differential Pair	15	20	40	50	14CerDIP, 14SBDIP
CA3046		15	20	40	50	14PDIP, 14SOIC
		f_T > 300MHz. 2 matched pairs ±5mV				
CA3081	General-Purpose NPN High-Current Transistors	16	20	40	100	16PDIP, 16CerDIP, 16SOIC (150 mil)
		Seven Common-Emitter				
CA3082		16	20	40	100	16PDIP, 16CerDIP, 16SOIC (150 mil)
		Seven Common-Collector				
CA3083		15	20	40	100	16PDIP, 16CerDIP, 16SOIC (150 mil)
		Five independent transistors. Q_1 and Q_2 matched; I_{IO} (at 1mA) 2.5µA Max				
CA3086	Three Isolated Transistors Plus a Differential Pair	15	20	40	50	14PDIP, 14CerDIP, 14SOIC
		f_T > 550MHz Typ Operation from DC to 120MHz				

TRANSISTOR ARRAYS: Electrical Characteristics $T_A = +25^oC$ **(Continued)**

TYPE	DESCRIPTION	$V_{(BR)\ CEO}$ (MIN) V	$V_{(BR)\ CBO}$ (MIN) V	h_{FE} (MIN)	I_C (MAX) mA	(NOTE 1) LEAD COUNT AND PACKAGE TYPE
CA3127	Five Independent Transistors	15	20	40	20	16PDIP, 16CerDIP, 16SOIC (150 mil)
		f_T > 1GHz. Operation from DC to 500MHz				
CA3146	Three Transistors Plus a Differential Pair	30	40	30	50	14PDIP, 14SOIC
CA3146A		40	50	30	50	
		f_T > 500MHz Typ Operation from DC to 120MHz				
CA3183	Five High-Current Transistors	30	40	40	75	16PDIP, 16SOIC (150 mil)
CA3183A		40	50	40	75	
		High-Voltage Versions of CA3083 Transistors Q_1 and Q_2 Matched at 1mA				
CA3227	Five Independent Transistors	8	12	40	20	16PDIP, 16SOIC (150 mil)
		f_T = 3GHz Typ Operation from DC to 1.5GHz				
CA3246	Three Independent Transistors Plus a Differential Pair	8	12	40	20	14PDIP, 14SOIC
		f_T = 3GHz Typ Operation from DC to 1.5GHz				

TYPE	DESCRIPTION	$V_{(BR)\ CEO}$ (MIN) V NPN/PNP	$V_{(BR)\ CBO}$ (MIN) V NPN/PNP	h_{FE} (MIN) NPN/PNP	I_C (MAX) NPN/PNP	(NOTE 1) LEAD COUNT AND PACKAGE TYPE
CA3096	Five Independent Transistors, 3 NPN, 2 PNP	35/-40	45/-40	150/20	50/-10	16PDIP, 16SOIC (150 mil)
CA3096A		35/-40	45/-40	150/20	50/-10	
CA3096C		24/-24	30/-24	100/15	50/-10	
		NPN		PNP		
		$\lvert V_{IO}\rvert$ = 5mV Max		5mV Max		
		$\lvert I_{IO}\rvert$ = 0.6µA Max		0.25µA Max		
HFA3046	Three 8GHz NPN Transistors Plus an NPN Differential Pair	8	12	40	15	14SOIC
		$\lvert V_{IO}\rvert$ = 5mV Max				
HFA3096	Three 8GHz NPN Transistors Plus Two 5.5GHz PNP Transistors	8	12/10	40/25	15	16SOIC (150 mil)
		NF = 3.5dB at 1GHz				
HFA3127	Five Independent 8GHz NPN Transistors	8	12	40	15	16SOIC (150 mil)
		NF = 3.5dB at 1GHz				
HFA3128	Five Independent 5.5GHz PNP Transistors	8	10	25	15	16SOIC (150 mil)
		NF = 3.5dB at 1GHz				

NOTE:

1. See Linear Package Selection Guide.

DIODE ARRAYS: T_A = +25°C. Apply for Each Diode

TYPE	DESCRIPTION	$V_{(BR)R}$ (MIN) V	I_R (MAX) μA	C_D (TYP) pF	$V_{F1} - V_{F2}$ (MAX) mV	(NOTE 1) PIN COUNT AND PACKAGE TYPE
CA3039	6 Individual	5	0.1	0.65	5 (I_F =1mA)	14SOIC, 12TO5
		ULTRA-FAST LOW-CAPACITANCE MATCHED DIODES				
CA3141	10 High Reverse Breakdown Voltage Diodes (Note 2)	30	0.1	0.3	0.55 (Typ Each Diode Pair)	16PDIP
		• Low-Noise Performance • Low-Leakage Current				

NOTES:

1. See Linear Package Selection Guide.
2. Six connected to form 3 common-cathode pairs. Four connected to form 2 common-anode diode pairs.

SPECIAL ANALOG CIRCUITS

TYPE	DESCRIPTION	FILE NUMBER OR AnswerFAX DOCUMENT NUMBER
CA555, LM555	Timers for Timing Delays and Oscillator Applications in Commercial, Industrial and Military Equipment	834
CA1391, CA1394	TV Horizontal Processors	981
CA3089	FM IF System	561
CA3126	TV Chroma Processor	860
CA3189	FM IF System	1046
CA3194	Single Chip PAL Luminance/Chroma Processor	1270
CA3217	Single Chip TV Chroma/Luminance Processor	1332
CA3256	BiMOS Analog Video Switch and Amplifier	1769
CD22402	Sync Generator for TV Applications and Video Processing Systems	1686
HA-2546	Wideband Two Quadrant Voltage Output Analog Multiplier	2861
HA-2547	Wideband Two Quadrant Current Output Analog Multiplier	2862
HA-2556	Wideband Four Quadrant Voltage Output Analog Multiplier	2477
HA-2557	Wideband Four Quadrant Current Output Analog Multiplier	2478
HA7210	Low Power Crystal Oscillator	3389
HA7211	Low Power Crystal Oscillator	3389
HFA5250	Ultra High-Speed Monolithic Pin Drive (500MHz)	2943
HFA5251	Ultra High-Speed Monolithic Pin Driver (800MHz)	3689
HFA5253	Wide Swing Ultra High-Speed Pin Driver (800MHz)	4003
ICL8013	Four Quadrant Analog Multiplier	2863
ICL8038	Precision Waveform Generator/Voltage Controlled Oscillator	2864
ICM7242	Long Range Fixed Timer	2866
ICM7555, ICM7556	General Purpose Timers	2867

Consumer Products

HORIZONTAL/VERTICAL COUNTDOWN AND SYNC PROCESSORS
CA1391, CA1394, CA3154, CA3202, CA3210, CA3223, CA3236, CA3241, CD22402

- Horizontal Oscillator/Drivers
- Horizontal Processors with 64, 32, 16, or 8 Divide Ratios
- CMOS Sync Generator With Genlock and Alternate Field Output
- PAL and NTSC Compatible
- Useful as Sync or Clock Regenerators

CHROMA/LUMA PROCESSORS AND DEMODULATORS
CA3070, CA3128Q, CA3126, CA3194, CA3234E, CA3217

- VCO with Phase Control and Shunt Regulator
- 3.58MHz Demodulator and Carrier Regenerator
- PAL Chroma Processor
- Single Chip PAL Luma/Chroma; Video to RGB Converter
- Single Chip Chroma/Luma; Video to RGB Converter
- Video/Chroma Processor

MISCELLANEOUS RADIO/TV FUNCTIONS
CA3224, CA3237, CA3253, CA1191

- Automatic CRT Bias Circuit
- IR Receiver Preamp and Demodulator
- AM Receiver
- TV Sound Demodulator and Audio AMP

SECURITY AND SURVEILLANCE
CA3253, CA3254, CA3255, CA3164A

- Vidicon Bias and AMP
- RS-170 Sync Generator for Camera Application
- PAL or NTSC Versions
- Universal Detection and Alarm Circuit

PRESCALERS/BAND SWITCHES
CA3247, CA3232, CA3163E, CA3179, CA3238E, CA3263

- TTL and CMOS Compatible
- Low Drive Current Input Requirement
- High Output Current Sink Capability

AUTOMOTIVE
CA3164, CA3228

- Reluctance Proximity Detector/Demodulator
- Clock Time Base and Motor Driver 0.5Hz
- 16 Channel Precision Timer/Diver

IF AMPLIFIER AND DETECTOR
CA2111A, CA3011, CA3102, CA3013, CA3014, CA3065, CA3089, CA3189

- FM IF Amplifiers with Limiters and Detectors
- Wide Band Amplifiers
- Wide Band Discriminator/Amplifiers
- Electronic Attenuators
- Quadrature Detect, AGC, and Log Output Devices
- FM IFs with Channel Detection
- TV Picture IFs

HORIZONTAL/VERTICAL COUNTDOWN AND SYNC PROCESSORS

CA1391, CA1394
TV HORIZONTAL PROCESSORS

- CA1391E - Positive Horizontal Sawtooth Input
- CA1394E - Negative Horizontal Sawtooth Input
- Internal Shunt Regulator
- Linear Balanced Phase Detector
- Preset Hold Control Capability
- Pull-In (Typ) . . . . . ±300Hz
- Low Thermal Frequency Drift
- Small Static Phase Error
- Variable Output Duty Cycle
- Adjustable DC Loop Gain

CA3210, CA3223
TV HORIZONTAL/VERTICAL COUNTDOWN DIGITAL SYNC SYSTEM

- Horizontal
- Driver
- Two Phase-Lock Loops
- Horizontal Oscillator
- Vertical Countdown
- Operation
  - CA3210E 525-Line
  - CA3223E 625-Line

CA3154
TV SYNC/AGC/HORIZONTAL SIGNAL PROCESSOR

- Horizontal Oscillator With AFC
- Sync Separator With Noise Immunity
- Strobed AGC System
- If AGC Output
- Delayed Outputs For Forward Or Reverse AGC Tuners
- Internal Noise Threshold
- High Impedance Video Input
- Choice Of Dual External Time Constants For Sync Separator Noise Immunity
- RF AGC Delay Externally Controlled
- Output Short-Circuit Protection

CA3236, CA3241
TV HORIZONTAL/VERTICAL COUNTDOWN DIGITAL SYNC SYSTEM

- CA3236 is the CA3210 with Modification
- CA3241 is the PAL Version of the CA3210
- Sync Separator
- Master Scan Oscillator . . . . . 64 x f_H
- Automatic Phase Control (APC) of Oscillator
- Horizontal/Vertical Countdown
- Vertical Output
- Horizontal Drive Output (Pulse-Width Modulator)

CA3202
TV HORIZONTAL/VERTICAL COUNTDOWN DIGITAL SYNC SYSTEM FEATURES

- Automatic Forced Asynchronous Mode To Remove Jitter
- Improved Low Voltage Start-Up Operation
- Lower Zero-State Horizontal-Drive Output
- Improved Symmetry For Horizontal-Drive Output

CA3218
TV HORIZONTAL/VERTICAL COUNTDOWN DIGITAL SYNC SYSTEM

- Horizontal Oscillator
- Vertical Countdown
- Composite Blanking Output
- Burst-Gate Output
- Horizontal Ramp Generator
- Internal Shunt Regulator

HORIZONTAL/VERTICAL COUNTDOWN AND SYNC PROCESSORS (Continued)

CD22402
CMOS LSI SYNC GENERATOR

- Interlaced Composite Sync Output
- Automatic Genlock Capability
- Crystal Oscillator Operation
- Operation. . . . . .525 Line or 625 Line
- Vertical Reset Option
- Wide Power Supply Operating Voltage. . . . . 4V to 15V
- Applications
  - Cameras
  - Monitors and Displays
  - CATV
  - Teletext
  - Video Games and Video Service Instruments
  - Sync Restorer
  - Scrambling/Descrambling Equipment

MISCELLANEOUS RADIO/TV FUNCTIONS

CA1191
TV SOUND IF AND AUDIO OUTPUT SUBSYSTEMS

- Nominal Power Output
  - 4W . . . . . V+ = 24V, R_L = 16Ω, Dist. = 10%
  - 2W . . . . . V+ = 12V, R_L = 8Ω, Dist. = 10%
- Wide Power Supply Range . . . . . 9V to 28V
- Low Quiescent Current . . . . . .25mA (Typ)
- 5kHz Deviation Sensitivity . . . . . 1W Output (Typ)
- 3dB Limiting Sensitivity . . . . . 50μV (Typ)
- Excellent AM Rejection . . . . . 50dB (Typ)
- Differential Peak Detector - Requires One Tuned Coil
- Electronic Volume Control With Improved Taper and Single Wire Control

CA3088
AM RECEIVER SUBSYSTEM AND GENERAL PURPOSE AMPLIFIER ARRAY

- Excellent Overload Characteristics
- AGC for IF Amplifier
- Buffered Output Signal for Tuning Meter
- Internal Zener Diode Provides Voltage Regulation
- Applications
  - AM Broadcast and Communications Receivers
  - AM Converter
  - IF Amplifiers
  - Detector
  - Audio Preamplifier

CA3224
AUTOMATIC PICTURE TUBE BIAS CIRCUIT

- Automatic Picture Tube Bias Cutoff Control
- Automatic Background Color Balance
- Eliminates Grey Scale Adjustments
- Compensates For Cathode-to-Heater Leakage

CA3237
IR REMOTE-CONTROL AMPLIFIER

- Integrated Circuit Package - 9 Lead SIP
- Excellent Overload Characteristics
- High Gain Amplifiers
- Schmitt Trigger Switching
- Power Supply 12V
- Low Power Dissipation
- Internal Regulation
- Nominal Sensitivity 100mV
- Nominal Input Impedance 50K

PRESCALERS/BAND SWITCHES

CA3247
ANALOG INTERFACE UNIT (AIU)

- Frequency Synthesizer for TV and CATV Channels (with 4MHz Crystal Oscillator for Reference)
- Interfaces to Microprocessor and Tuner for Receiver Controls
- Circuit to Decode Remote Control Transmissions
- On Screen Display (OSD) With RGB Signal Output
- 9 D/A Converters for Analog Control Functions
- PLL Control of Tuner Interface Circuits
- Three Wire Serial Bus Interface
- Applications
  - For Television and CATV Tuning/Interface Control
  - Tuner Test Equipment
  - Remote

CA3238E
BIMOS INPUT OP AMP, FREQUENCY BAND-SELECT SWITCH AND QUAD COMPARATOR

- Input Operational Amplifier - High Impedance PMOS Input Transistors and Internal Reference Bias
- Low Input Bias Current and Internal Diode Protection at Op Amp Inputs
- High Op Amp Output Voltage Swing . . . . . 0.2V-28V DC with 3mA Source or Sink Capability
- Logic Controlled Bandswitching with Four Separate Outputs
- Two Bandswitch Output Current Sinks
- Two Bandswitch Current-limited Output Current Sources
- Internally Referenced Quad Comparator
- Low Input Drive Current Requirement
- Low Output Leakage
- High Output Current Sink Capability
- Bipolar and PMOS Processes on a Single Chip
- Applications
  - Television Tuning Interfacing

CA3163E
VHF/UHF PRESCALER ÷64/256

- Broadband Operation. . . . . 90MHz to 1000MHz
- High Sensitivity
- Standard Power Supply 5V
- Dual Mode Operation
  - VHF/UHF

CA3179
1.25GHz PRESCALER

- Broadband Operation
  - DC to 1.25GHz
- High Sensitivity
- Standard T^2L or ECL Power Supply
- Dual Mode Operation
  - VHF/UHF. . . . . ÷64/÷256

CA3232
÷20 PRESCALER

- Operation 200MHz
- TTL and CMOS Compatible
- Power Supply. 5V
- Open Collector Output Stage
- Applications
  - Digital Synthesizers
  - Counters
  - AM/FM Communications Circuit

CA3263
TV TUNER CONTROL CIRCUIT INVERTER, OPERATIONAL AMPLIFIER, FREQUENCY AND BAND-SELECT SWITCH

- 2 Input - 4 Output Bandswitch
- High-Output Current Drive - Low Saturation Voltage
- Applications
  - TV and CATV Use
  - Frequency or Voltage Synthesizer Television Tuning Systems

IF AMPLIFIERS AND DETECTORS

CA2111A
FM IF AMPLIFIER-LIMITER AND QUADRATURE DETECTOR

- Direct Replacement for ULN2111A and MC1357
- Good Sensitivity:
  - Input Limiting Voltage (Knee) 400mV
  - Typ 10.7MHz; 250mV
  - Typ . . . . . 4.5 MHz and 5.5MHz
- Excellent AM Rejection
  - 45dB (Typ) 10.7MHz
- Provision for Output From 3-Stage IF Amplifier Section
- Applications
  - FM IF and TV Sound IF Applications

CA3012
WIDEBAND AMPLIFIERS

- Exceptionally High Amplifier Gain
  - Power Gain (Typ) . . . . . 4.5MHz - 75dB
- Excellent Limiting Characteristics
  - Input Limiting Voltage (Knee) 600μV
    Typ 10.7MHz
- Wide Frequency Capability
  - 100kHz to > 20MHz

CA3013, CA3014
WIDEBAND AMPLIFIER DISCRIMINATORS

- Exceptionally High Gain
  - Power Gain (Typ) . . . . . 4.5MHz - 75dB
- Excellent Limiting Characteristics
  - Input Limiting Voltage (Knee) 300mV
    Typ 4.5MHz
- Excellent AM Rejection
  - >50dB 4.5MHz
- High Audio-Voltage Recovery
  - 220mV (Typ) . . . . . 4.5MHz, 25kHz Deviation

CA3089
FM IF SYSTEM
CA3189
FM IF SYSTEM WITH ON CHANNEL DETECTOR

- Exceptional Limiting Sensitivity
  - 12mV (Typ) . . . . . -3dB Point
- Low Distortion
  - 0.1% (Typ) (with Double Tuned Coil)
- Single Coil Tuning Capability
- Improved S + N/N Ratio
- Externally Programmable Recovered Audio Level
- Provides Specific Signal for Control of Interchannel Muting (Squelch)
- Provides Specific Signal for Direct Drive of a Tuning Meter
- On Channel Step for Search Control
- Provides Programmable AGC Voltage for RF Amplifier
- Provides a Specific Circuit for Flexible Audio Output
- Internal Supply Voltage Regulators
- Applications
  - FM IF Amplifier Applications In High-Fidelity
  - Automotive
  - Communications Receivers
  - IF Amplifier
  - Quadrature Detector
  - AF Preamplifier,
  - Specific Circuits for AGC
  - AFC, Muting (Squelch)
  - Tuning Meter

CA3065
IF AMPLIFIER-LIMITER, FM DETECTOR, ELECTRONIC ATTENUATOR, AUDIO DRIVER

- Electronic Attenuator - Replaces Conventional Volume Control
- Differential Peak Detector - Requires One Single Tuned Coil
- Internal Zener Diode Regulated Supply
- Inherent High Stability

CHROMA/LUMA SYSTEMS

CA3070
TELEVISION CHROMA SYSTEM

- Voltage Controlled Oscillator
- Keyed APC and ACC Detectors
- DC Hue Control
- Shunt Regulator

CA3128Q
TV CHROMA PROCESSOR FOR PAL SYSTEMS

- Phase-Locked Subcarrier Regeneration Utilizes Sample-and-hold Techniques in the Automatic Frequency Phase Control (AFPC) Servo Loop
- Automatic Chrominance Control (ACC)/Killer Detector Employes Sample-and-Hold Techniques
- Supplementary ACC with an Overload Detector to Prevent Oversaturation of the Picture Tube
- Sinusoidal Subcarrier Output

CA3126
TV CHROMA PROCESSOR AND CARRIER REGENERATOR

- Phase-Locked Subcarrier Regeneration Utilizes Sample-and-Hold Techniques
- Automatic Chrominance Control (ACC)/Killer Detector Employes Sample-and-Hold Techniques
- Supplementary ACC with An Overload Detector to Prevent Oversaturation of the Picture Tube
- Sinusoidal Subcarrier Output
- Keyed Chroma Output
- Emitter-Follower Buffered Outputs For Low Output Impedance
- Linear DC Saturation Control

CA3234E
LUMINANCE/CHROMA PROCESSOR

- Complete Chroma Processing and Demodulating Circuitry With RGB Outputs on a Single Chip in a 28 Lead Plastic Package
- DC Peaking with Noise Processing
- DC Picture Control with Automatic Beam Limiter
- DC Controlled Black Level (Brightness)

CA3194
SINGLE CHIP PAL LUMINANCE/CHROMA PROCESSOR

- All PAL Luminance and Chrominance Processing Circuitry On A Single Chip in a 24 Lead Plastic Package
- Phase Locked Subcarrier Regeneration Utilizing Sample-and-Hold
- DC Controls for Brightness, Contrast, and Color Saturation Functions
- Input for Average Beam-Current Limiting
- Contrast Control Having Excellent Tracking of Luma and Chroma Channels
- Low Impedance RGB Outputs with Excellent Tracking for Direct Coupling to Video Driver Circuitry
- Applications
  - PAL to RGB Conversion

CA3217
SINGLE CHIP NTSC TV CHROMA/LUMINANCE PROCESSOR

- All Chroma Processing and Demodulating Circuitry on a Single Chip in a 28 Lead Plastic Package
- Phase-Locked Subcarrier Regeneration Utilizing Sample-and-Hold Techniques
- Supplementary ACC with Overload Detector to Prevent Over Saturation of the Picture Tube
- Linear DC Controls for Chroma Gain and Tint
- Dynamic "Flesh Correction" Corrects Purple and Green Flesh Colors Without Affecting Primary Colors
- Balanced Chroma Demodulators with Low Output Impedance for Direct Coupling
- Internal RF Filtering
- Requires Few External Components
- Automatic Beam Limiter
- Chroma Luminance Tracking Picture Control
- Applications
  - NTSC to RGB Conversion

SECURITY AND SURVEILLANCE

CA3253
VIDEO PROCESSOR

- Video Amplifier
- AGC Amplifier
- Blanking Pulse and Sync Pulse Addition
- Black Clipping
- Applications
  - All RS-170 Sync Systems
  - Security Cameras
  - CCTV Systems
  - Cable Systems
  - Text Encoder Sync
  - Computer Display Systems
  - Graphic Systems
  - Video Camera

CA3254, CA3255
RS-170 SYNC GENERATOR (CA3254)

- Single LSI IC with Multiple Genlock Capability
- EIA RS-170 Sync with 2:1 Interlace
- PLL for Lock to Power Line Zero Crossing
- Genlocks to RS-170, RS-330 or Random Interlace
- Crystal Control Mode Sync Option
- Four Modes of Genlock Control
- I^2L Injection Configured to Work in Series with the Camera Tube Filament
- Applications
  - All RS-170 Sync Systems
  - Security Cameras
  - CCTV Systems
  - Cable Systems
  - Text Encoder Sync
  - Computer Display Systems
  - Graphics Systems

CA3164A
BIMOS SINGLE-CHIP DETECTOR/ALARM SYSTEM

- Interfaces Directly with High Z Sensors - No External Buffer FET Required
- Low Input Current . . . . . 1pA (Max)
- Gate Protected Input Terminals
- On-Chip Beep Oscillator for Low Battery Indication
- Applications
  - Burglar Alarms
  - Proximity Detectors
  - Level Detectors
  - Ion Chamber Particle Detection
  - Integral Drivers for Mechanical and Piezoelectric Horn Alarms

AUTOMOTIVE SPECIAL FUNCTION

CA3228
SPEED-CONTROL SYSTEM

- Low Power Dissipation
- I^2L Control Logic
- Power-On Reset
- On-Chip Oscillator for System Time Reference
- Single Input Line for Operator Commands
- Amplitude Encoded Control Signals
- Transient Compensated Input Commands
- Controlled Acceleration Mode
- Internal Redundant Brake and Low Speed Disable
- Braking Disable
- Applications
  - Automotive Speed Control
  - Residential and Industrial Heating and Cooling Controls
  - Industrial AC and DC Motor Speed Control
  - Applications Requiring Acceleration and Deceleration Control

CA3165
ELECTRONIC SWITCHING CIRCUIT

- Switching Initiated by Damping of Internal Oscillator
- Proximity Sensing of Rotational Motion
- Repeatable Timing of Switching States
- Five Outputs - Two Complementary Pairs and One Non-Inverting Output (CA3165E1)
- Two Outputs - One Complementary Pair (CA3165E)

Linear Package Selection Guide

Using the Selection Guide:

The first character of each entry indicates the package type, while the number preceding the decimal point details the package lead count. Except for Can packages, the decimal point and succeeding numbers specify the package width in inches (e.g. __.15 = 150 mil width). The entire entry indicates the table containing the appropriate package dimensions (e.g. 8 lead PDIP dimension are detailed in Table E8.3).

PART NUMBER	PDIP	SOIC	PLCC	CerDIP	SIDEBRAZE	CAN
CA124	E14.3	M14.15	-	-	-	-
CA1391	E8.3	-	-	-	-	-
CA1394	E8.3	-	-	-	-	-
CA139	E14.3	M14.15	-	F14.3	-	-
CA1458	E8.3	-	-	-	-	T8.C
CA1558	E8.3	-	-	-	-	T8.C
CA158	E8.3	M8.15	-	-	-	T8.C
CA224	E14.3	M14.15	-	-	-	-
CA239	E14.3	M14.15	-	F14.3	-	-
CA258	E8.3	M8.15	-	-	-	T8.C
CA2904	E8.3	M8.15	-	-	-	-
CA3018	-	-	-	-	-	T12.B
CA3020	-	-	-	-	-	T12.B
CA3028	E8.3	M8.15	-	-	-	T8.C
CA3039	-	M14.15	-	-	-	T12.B
CA3045	-	-	-	F14.3	D14.3	-
CA3046	E14.3	M14.15	-	-	-	-
CA3049	-	-	-	-	-	T12.B
CA3053	E8.3	M8.15	-	-	-	T8.C
CA3054	E14.3	M14.15	-	-	-	-
CA3060	E16.3	-	-	-	-	-
CA3078	E8.3	M8.15	-	-	-	T8.C
CA3080	E8.3	M8.15	-	-	-	T8.C
CA3081	E16.3	M16.15	-	F16.3	-	-
CA3082	E16.3	M16.15	-	F16.3	-	-
CA3083	E16.3	M16.15	-	F16.3	-	-
CA3086	E14.3	M14.15	-	F14.3	-	-
CA3089	E16.3	M20.3	-	F16.3	-	-
CA3094	E8.3	M8.15	-	-	-	T8.C
CA3096	E16.3	M16.15	-	-	-	-
CA3098	E8.3	-	-	-	-	-
CA3100	E8.3	M8.15	-	-	-	T8.C
CA3102	E14.3	M14.15	-	-	-	-
CA3126	E16.3	M20.3	-	-	-	-
CA3127	E16.3	M16.15	-	F16.3	-	-

EXAMPLE: **M 16 .15**

PACKAGE TYPE — LEAD COUNT — BODY WIDTH

Package outlines and dimensions are available in Section 10.

Linear Package Selection Guide

PART NUMBER	PDIP	SOIC	PLCC	CerDIP	SIDEBRAZE	CAN
CA3130	E8.3	M8.15	-	-	-	T8.C
CA3140	E8.3	M8.15	-	-	-	T8.C
CA3141	E16.3	-	-	-	-	-
CA3146	E14.3	M14.15	-	-	-	-
CA3160	E8.3	-	-	-	-	T8.C
CA3183	E16.3	M16.15	-	-	-	-
CA3189	E16.3	-	-	-	-	-
CA3193	E8.3	-	-	-	-	T8.C
CA3194	E24.6	-	-	-	-	-
CA3217	E28.6	-	-	-	-	-
CA3227	E16.3	M16.15	-	-	-	-
CA324	E14.3	M14.15	-	-	-	-
CA3240	E8.3, E14.3	-	-	-	-	-
CA3246	E14.3	M14.15	-	-	-	-
CA3256	E18.3	M20.3	-	-	-	-
CA3260	E8.3	-	-	-	-	T8.C
CA3280	E16.3	-	-	F16.3	-	-
CA3290	E8.3, E14.3	-	-	-	-	T8.C
CA339	E14.3	M14.15	-	F14.3	-	-
CA3420	E8.3	-	-	-	-	T8.C
CA3440	E8.3	M8.15	-	-	-	T8.C
CA3450	E16.3	-	-	-	-	-
CA358	E8.3	M8.15	-	-	-	T8.C
CA5130	E8.3	M8.15	-	-	-	T8.C
CA5160	E8.3	M8.15	-	-	-	T8.C
CA5260	E8.3	M8.15	-	-	-	T8.C
CA5420	E8.3	M8.15	-	-	-	T8.C
CA5470	E14.3	M14.15	-	-	-	-
CA555	E8.3	M8.15	-	-	-	T8.C
CA741	E8.3	-	-	-	-	T8.C
HA-2400	-	-	-	F16.3	-	-
HA-2404	-	-	-	F16.3	-	-
HA-2405	E16.3	-	N20.35	F16.3	-	-
HA-2406	E16.3	M16.3	-	F16.3	-	-
HA-2420	-	-	-	F14.3	-	-
HA-2425	E14.3	M14.15	N20.35	F14.3	-	-
HA-2444	E16.3	M16.3	-	-	-	-
HA-2500	-	-	-	F8.3A	-	T8.C
HA-2502	-	-	-	F8.3A	-	T8.C
HA-2505	E8.3	-	N20.35	F8.3A	-	T8.C
HA-2510	-	-	-	F8.3A	-	T8.C

EXAMPLE: **M 16 .15**

PACKAGE TYPE — LEAD COUNT — BODY WIDTH

Package outlines and dimensions are available in Section 10.

Linear Package Selection Guide

PART NUMBER	PDIP	SOIC	PLCC	CerDIP	SIDEBRAZE	CAN
HA-2512	-	-	-	F8.3A	-	T8.C
HA-2515	E8.3	-	-	F8.3A	-	T8.C
HA-2520	-	-	-	F8.3A	-	T8.C
HA-2522	-	-	-	F8.3A	-	T8.C
HA-2525	E8.3	M8.15	N20.35	F8.3A	-	T8.C
HA-2529	E8.3	M8.15	-	F8.3A	-	T8.C
HA-2539	E14.3	M14.15	N20.35	F14.3	-	-
HA-2540	E14.3	M14.15	N20.35	F14.3	-	-
HA-2541	-	-	-	F14.3	-	T12.C
HA-2542	E14.3	-	-	F14.3	-	T12.C
HA-2544	E8.3	M8.15	N20.35	F8.3A	-	T8.C
HA-2546	E16.3	M16.3	-	F16.3	-	-
HA-2547	-	-	-	F16.3	-	-
HA-2548	E8.3	M16.3	-	-	D8.3	T8.C
HA-2556	E16.3	M16.3	-	F16.3	-	-
HA-2557	E16.3	M16.3	-	F16.3	-	-
HA-2600	-	-	-	F8.3A	-	T8.C
HA-2602	-	-	-	F8.3A	-	T8.C
HA-2605	E8.3	M8.15	N20.35	F8.3A	-	T8.C
HA-2620	-	-	-	F8.3A	-	T8.C
HA-2622	-	-	-	F8.3A	-	T8.C
HA-2625	E8.3	M8.15	N20.35	F8.3A	-	T8.C
HA-2640	-	-	-	F8.3A	-	T8.C
HA-2645	-	-	-	F8.3A	-	T8.C
HA-2705	E8.3	M8.15	-	-	-	T8.C
HA-2839	E14.3	-	-	F14.3	-	-
HA-2840	E8.3, E14.3	M8.15	-	F8.3A, F14.3	-	-
HA-2841	E8.3, E14.3	M8.15	-	-	-	-
HA-2842	E8.3, E14.3	M8.15	-	-	-	-
HA-2850	E8.3, E14.3	M8.15	-	F8.3A, F14.3	-	-
HA4201	E8.3	M8.15	-	-	-	-
HA4314A	E14.3	M14.15	-	-	-	-
HA4344B	E16.3	M16.15	-	-	-	-
HA4404A	E16.3	M16.15	-	-	-	-
HA4600	E8.3	M8.15	-	-	-	-
HA-4741	E14.3	M16.3	N20.35	F14.3	-	-
HA-4900	-	-	-	F16.3	-	-
HA-4902	-	-	-	F16.3	-	-
HA-4905	E16.3	M16.3	N20.35	F16.3	-	-
HA-5002	E8.3	M8.15	N20.35	F8.3A	-	T8.C
HA-5004	E14.3	M14.15	-	F14.3	-	-

EXAMPLE: **M 16 .15**

PACKAGE TYPE — LEAD COUNT — BODY WIDTH

Package outlines and dimensions are available in Section 10.

PART NUMBER	PDIP	SOIC	PLCC	CerDIP	SIDEBRAZE	CAN
HA5013	E14.3	M14.15	-	-	-	-
HA-5020	E8.3	M8.15	-	F8.3A	-	-
HA5022	E16.3	M16.15	-	F16.3	-	-
HA5023	E8.3	M8.15	-	F8.3A	-	-
HA5024	E20.3	M20.3	-		-	-
HA5025	E14.3	M14.15	-		-	-
HA-5033	E8.3	-	N20.35	-	-	T12.C
HA-5101	E8.3	M8.15	N20.35	F8.3A	-	T8.C
HA-5102	E8.3	M16.3	N20.35	F8.3A	-	T8.C
HA-5104	E14.3	M16.3	N20.35	F14.3	-	-
HA-5111	E8.3	M8.15	-	F8.3A	-	T8.C
HA-5112	E8.3	M16.3	-	F8.3A	-	T8.C
HA-5114	E14.3	M16.3	N20.35	F14.3	-	-
HA-5127	E8.3	M8.15	-	F8.3A	-	T8.C
HA-5130	-	-	-	F8.3A	-	T8.C
HA-5134	-	-	-	F14.3	-	-
HA-5135	-	-	-	F8.3A	-	T8.C
HA-5137	E8.3	M8.15	-	F8.3A	-	T8.C
HA-5142	E8.3	M16.3	-	F8.3A	-	T8.C
HA-5144	E14.3	M16.3	N20.35	F14.3	-	-
HA-5147	E8.3	-	-	F8.3A	-	T8.C
HA-5160	-	-	-	-	-	T8.C
HA-5162	-	-	-	-	-	T8.C
HA-5170	-	-	-	F8.3A	-	T8.C
HA-5177	E8.3	M8.15	-	F8.3A	-	T8.C
HA-5190	-	-	-	F14.3	-	T12.C
HA-5195	-	M14.15	-	F14.3	-	T12.C
HA-5221	E8.3	M8.15	-	F8.3A	-	T8.C
HA-5222	E16.3	M16.3	-	F8.3A	-	-
HA-5320	E14.3	M16.3	-	F14.3	-	-
HA-5330	E14.3	-	-	F14.3	-	-
HA-5340	E14.3	M16.3	-	F14.3	-	-
HA5351	E8.3	M8.15	-	-	-	-
HA5352	E14.3	M16.3	-	-	-	-
HA7210	E8.3	M8.15	-	-	-	-
HA7211	-	M8.15	-	-	-	-
HFA1100	E8.3	M8.15	-	F8.3A	-	-
HFA1102	E8.3	M8.15	-	-	-	-
HFA1103	E8.3	M8.15	-	-	-	-
HFA1105	E8.3	M8.15	-	F8.3A	-	-
HFA1106	E8.3	M8.15	-	F8.3A	-	-

EXAMPLE: **M 16 .15**

PACKAGE TYPE — LEAD COUNT — BODY WIDTH

Package outlines and dimensions are available in Section 10.

Linear Package Selection Guide

PART NUMBER	PDIP	SOIC	PLCC	CerDIP	SIDEBRAZE	CAN
HFA1110	E8.3	M8.15	-	F8.3A	-	-
HFA1112	E8.3	M8.15	-	F8.3A	-	-
HFA1113	E8.3	M8.15	-	F8.3A	-	-
HFA1114	E8.3	M8.15	-	-	-	-
HFA1115	E8.3	M8.15		F8.3A	-	-
HFA1120	E8.3	M8.15	-	F8.3A	-	-
HFA1130	E8.3	M8.15	-	F8.3A	-	-
HFA1135	E8.3	M8.15	-	F8.3A	-	-
HFA1145	E8.3	M8.15	-	F8.3A	-	-
HFA1205	E8.3	M8.15	-	-	-	-
HFA1212	E8.3	M8.15	-	F8.3A	-	-
HFA1245	E14.3	M14.15	-	F14.3	-	-
HFA1405	-	M14.15	-	-	-	-
HFA1412	E14.3	M14.15	-	F14.3	-	-
HFA3046	-	M14.15	-	-	-	-
HFA3096	-	M16.15	-	-	-	-
HFA3127	-	M16.15	-	-	-	-
HFA3128	-	M16.15	-	-	-	-
HFA5250	-	M28.3	-	-	-	-
HFA5253	-	M20.3A	-	-	-	-
ICL7611	E8.3	M8.15	-	-	-	T8.C
ICL7612	E8.3	M8.15	-	-	-	T8.C
ICL7621	E8.3	M8.15	-	-	-	T8.C
ICL7641	E14.3	-	-	-	-	-
ICL7642	E14.3	-	-	F14.3	-	-
ICL7650S	E8.3, E14.3	M8.15, M14.15	-	F14.3	-	T8.C
ICL8013	-	-	-	-	-	T10.C
ICL8038	E14.3	-	-	F14.3	-	-
ICM7242	E8.3	M8.15	-	-	-	-
ICM7555	E8.3	M8.15	-	-	-	T8.C
ICM7556	E14.3	-	-	F14.3	-	-
LM1458	E8.3	-	-	-	-	T8.C
LM1558	-	-	-	-	-	T8.C
LM2902	E14.3	M14.15	-	-	-	-
LM2904	E8.3	-	-	-	-	-
LM324	E14.3	-	-	-	-	-
LM339	E14.3	-	-	-	-	-
LM358	E8.3	-	-	-	-	-
LM555	E8.3	-	-	-	-	T8.C
LM741	E8.3	-	-	-	-	T8.C

EXAMPLE: **M 16 .15**

PACKAGE TYPE — LEAD COUNT — BODY WIDTH

Package outlines and dimensions are available in Section 10.

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New Data Acquisition Products

A/D CONVERTERS

HI1166
8-BIT, 250 MSPS A/D CONVERTER

AnswerFAX DOCUMENT # 3579

- INL . . . . . ±0.5 LSB
- DNL . . . . . ±0.5 LSB
- Power Consumption. 1.4W
- SINAD (60MHz) 37dB
- ECL Logic Compatible

HI1276
8-BIT, 500 MSPS A/D CONVERTER

AnswerFAX DOCUMENT # 3578

- INL . . . . . ±0.7 LSB
- DNL . . . . . ±0.5 LSB
- Power Consumption 2.8W
- SINAD (100MHz) 37dB
- ECL Logic Compatible

HI1175
8-BIT, 20 MSPS A/D CONVERTER

AnswerFAX DOCUMENT # 3577

- INL . . . . . ±1.3 LSB
- DNL . . . . . ±0.5 LSB
- Power Consumption. 60mW
- SINAD (3.85MHz) 43dB
- TTL Logic Compatible
- Internal Voltage Reference

HI1396
8-BIT, 125 MSPS A/D CONVERTER

AnswerFAX DOCUMENT # 3576

- INL . . . . . ±0.5 LSB
- DNL . . . . . ±0.5 LSB
- SINAD (32MHz) 40dB
- Power Consumption 870mW
- ECL Logic Compatible

HI1176
8-BIT VIDEO A/D CONVERTER

AnswerFAX DOCUMENT # 3582

- Sampling Rate . . . . . 20 MSPS
- INL . . . . . ±1.3 LSB
- DNL . . . . . ±0.5 LSB
- Power Consumption. 60mW
- SINAD (3.85MHz) 43dB
- TTL Logic Compatible
- Internal DC Restore Circuit
- Internal Voltage Reference

HI5703
10-BIT, 40 MSPS A/D CONVERTER

AnswerFAX DOCUMENT # 3950

- INL . . . . . ±1.0 LSB
- DNL . . . . . ±0.5 LSB
- SINAD (10MHz) 56dB
- Power Consumption 400mW
- Digital Output . . . . . -3.3V/5V
- 250MHz Full Power Input Bandwidth
- TTL Compatible Interface

HI1179
8-BIT 35 MSPS A/D CONVERTER

AnswerFAX DOCUMENT # 3666

- INL . . . . . +1.3 LSB, -1.0 LSB
- DNL . . . . . ±0.5 LSB
- SINAD (5MHz) 45dB
- Power Consumption. 80mW
- Internal DC Restore Circuit
- Internal Voltage Reference
- TTL Logic Compatible

HI5705
10-BIT, 40 MSPS LOW COST A/D CONVERTER

AnswerFAX DOCUMENT # 4017

- INL . . . . . ±1.0 LSB
- DNL . . . . . ±0.5 LSB
- -65MHz Full Power Input Bandwidth
- SINAD (5MHz) 57dB
- Differential Gain (17.72MHz). 0.5%
- Differential Phase Error (17.72MHz) . . . . . 0.25 Degree
- TTL Compatible Interface

A/D CONVERTERS (Continued)

HI5710
10-BIT 20 MSPS A/D CONVERTER

AnswerFAX DOCUMENT # 3921

- INL ..... ±1.0 LSB
- DNL ..... ±0.5 LSB
- SINAD 47dB
- Power Consumption 140mW
- No Sample and Hold Required
- TTL/CMOS Compatible Inputs

HI5812
12-BIT, 20µs A/D CONVERTER

AnswerFAX DOCUMENT # 3214

- Conversion Time 20µs
- INL ..... ±1 LSB
- DNL ..... ±1 LSB
- Single Supply +5V
- Low Cost

HI5714
8-BIT, 75 MSPS A/D CONVERTER

AnswerFAX DOCUMENT # 3973

- INL ..... ±0.5 LSB
- DNL ..... ±0.35 LSB
- Power Consumption 325mW
- 7.7 ENOB 4.43MHz
- TTL Compatible

HI5813
12-BIT, 3.3V SAMPLING A/D CONVERTER

AnswerFAX DOCUMENT # 3634

- Conversion Time 25µs
- INL ..... ±2.5 LSB
- DNL ..... ±2.0 LSB
- Power Consumption 3.3mW
- Low Cost

HI5810
12-BIT, 40mW SAMPLING A/D CONVERTER

AnswerFAX DOCUMENT # 3633

- Conversion Time 10µs
- INL ..... ±2.0 LSB
- DNL ..... ±2.0 LSB
- Single Supply +5V
- Low Cost

HI5816
12-BIT 20µs A/D CONVERTER WITH SERIAL INTERFACE

AnswerFAX DOCUMENT # 3664

- Conversion Time 20µs
- INL ..... ±0.75 LSB
- DNL ..... ±1.0 LSB
- Single Supply ..... +5V
- Low Cost
- Serial Bus Interface, SPI™, QSPI™, Microwire™ Compatible (Note 1)

HI5804
12-BIT, 5 MSPS LOW COST A/D CONVERTER

AnswerFAX DOCUMENT # 4026

- INL ..... ±1.0 LSB
- DNL ..... ±0.5 LSB
- SINAD (1MHz) 64dB
- Power Consumption 300mW

HI7190
24-BIT SIGMA-DELTA A/D CONVERTER

AnswerFAX DOCUMENT # 3612

- Throughput 2kHz-10Hz
- INL ..... 0.0007% FSR
- Power Consumption 10mW
- Internal PGIA, -120dB 60/50Hz Line Noise Rejection
- 20 Lead DIP and SOIC Packages
- Serial Bus Interface, SPI™, QSPI™, Microwire™ Compatible (Note 1)

NOTE:

1. SPI™, QSPI™ are trademarks of National Semiconductor. Microwire™ is a trademark of Motorola.

D/A CONVERTERS

HI1171
8-BIT 40 MSPS D/A CONVERTER

AnswerFAX DOCUMENT # 3662

- INL . . . . . ±1.0 LSB
- DNL . . . . . ±0.5 LSB
- Power Consumption. 80mW
- TTL Compatible Inputs

HI3050
10-BIT 50 MSPS 3-CHANNEL D/A CONVERTER

AnswerFAX DOCUMENT # 3936

- INL (Max) . . . . . ±2.0 LSB
- DNL (Max). . . . . ±0.5 LSB
- Power Consumption 500mW
- Settling Time at $R_L = 75\Omega$, $I_{OUT} = 13.5mA$ 40ns
- CMOS Compatible Inputs

HI20201, HI20203
10-BIT/8-BIT 160 MSPS D/A CONVERTER

AnswerFAX DOCUMENT # 3581

- INL . . . . . ±1.0 LSB
- DNL . . . . . ±0.5 LSB
- Power Consumption. 420mW
- ECL Compatible Inputs

HI5721
10-BIT, 125 MSPS HIGH SPEED D/A CONVERTER

AnswerFAX DOCUMENT # 3949

- INL . . . . . ±0.5 LSB
- DNL . . . . . ±0.5 LSB
- Power Consumption 700mW
- SFDR to Nyquist at
  - $f_{CLK} = 125MHz$, $f_{OUT} = 2.02MHz$, 62.5MHz Span. . .-59dBc
- TTL/CMOS Compatible Inputs

INTERFACE

HIN230, HIN241
RS-232, +5.0V TRANSCEIVERS

AnswerFAX DOCUMENT # 3138

HARRIS PART NUMBER	POWER SUPPLY	NO. OF RS-232 DRIVERS	NO. OF RS-232 RECEIVERS	NO. OF EXTERNAL 1µF CAPACITORS	SHUTDOWN	THREE-STATE	NO. OF PINS/ PACKAGE
HIN230	+5.0V	5	0	4	Yes	No	20
HIN231	+5.0V and 7.5V to +13.2V	2	2	2	No	No	16
HIN232	+5.0V	2	2	4	No	No	16
HIN234	+5.0V	4	0	4	No	No	16
HIN236	+5.0V	4	3	4	Yes	Yes	24
HIN237	+5.0V	5	3	4	No	No	24
HIN238	+5.0V	4	4	4	No	No	24
HIN239	+5.0V and 7.5V to +13.2V	3	5	2	No	Yes	24
HIN240	+5.0V	5	5	4	Yes	Yes	44
HIN241	+5.0V	4	5	4	Yes	Yes	28

MULTIPLEXERS

DG406, DG407
16 CH/8 CH DIFFERENTIAL MULTIPLEXERS

AnswerFAX DOCUMENT # 3116

- On-Resistance 100Ω
- Fast Switching
  - Transition 300ns
  - Off 150ns
- Low Power . . . . . <38mW
- Upgrade for DG506A, DG507A

DG408, DG409
8 CH/4 CH DIFFERENTIAL MULTIPLEXERS

AnswerFAX DOCUMENT # 3283

- On-Resistance 100Ω
- Fast Switching
  - Transition 250ns
  - Off 150ns
- Low Power . . . . . <38mW
- Upgrade for DG508A, DG509A

DG408, DG409
EXTENDED PROCESS FLOW

AnswerFAX DOCUMENT # 7022

- Tested to Industrial Grade Electrical Specifications
- 100% Burn-In for 160 Hours
- 100% Tested at -40°C and +85°C
- Plastic DIP and SOIC Packages
- Ideal for Avionics, Military, and Other Harsh-Environment Applications

CRYSTAL OSCILLATOR

HA7210
LOW POWER OSCILLATOR

AnswerFAX DOCUMENT # 3389

- Operating Frequency Range . . . . . 10kHz to 10MHz
- Low Supply Current . . . . . 5µA at 32kHz
- Low Supply Current . . . . . 130µA at 1MHz
- $2.0V_{DC}$ to $7.0V_{DC}$ Operation
- Only Requires an External Crystal for Operation

SWITCHES

DG401, DG403, DG405, DG411, DG412, DG413, DG442, DG444 EXTENDED PROCESS FLOW

AnswerFAX DOCUMENT # 7022

- Tested to Industrial Grade Electrical Specifications
- 100% Burn-In for 160 Hours
- 100% Tested at -40°C and +85°C
- Plastic DIP and SOIC Packages
- Ideal for Avionics, Military, and Other Harsh-Environment Applications

DG401, DG403, DG405 HIGH SPEED DUAL SWITCHES

AnswerFAX DOCUMENT # 3284

- On-Resistance 45Ω
- Fast Switching
  - On. 150ns
  - Off. 60ns
- Ultra Low Power. . . . . <35µW
- PDIP and SOIC Packages

DG411, DG412, DG413 PRECISION QUAD SPST SWITCHES

AnswerFAX DOCUMENT # 3282

- On-Resistance 35Ω
- Fast Switching
  - On. 175ns
  - Off. 145ns
- Ultra Low Power. . . . . <35µW
- Single Supply Capability

DG441, DG442 QUAD SPST SWITCHES

AnswerFAX DOCUMENT # 3281

- On-Resistance 85Ω
- Fast Switching
  - On 250ns
  - Off (DG441) 120ns
- Low Power . . . . . .<1.6mW
- Internal Voltage Reference
- Upgrade for DG201A, DG202

DG444, DG445 LOW COST QUAD SPST SWITCHES

AnswerFAX DOCUMENT # 3586

- On-Resistance 85Ω
- Fast Switching
  - On 250ns
  - Off (DG444) 120ns
- Ultra Low Power . . . . . .<35µW
- Upgrade for DG211, DG212

Data Acquisition Ordering Information

HARRIS PRODUCT CODE EXAMPLE

HI 1 - 0506 - 5

PREFIX

HARRIS INTERFACE

PACKAGE
- 1: Dual-in-line, Ceramic
- 2: TO metal can
- 3: Dual-in-line, Plastic
- 4: Leadless Chip Carrier
- 4P: Plastic Leaded Chip Carrier
- 9: Flatpack
- 9P: SOIC
- 0: Chip Form

PART NUMBER

TEMPERATURE
- -2: -55°C to +125°C
- -4: -25°C to +85°C
- -5: 0°C to +75°C
- -6: +25°C DICE Probe
- -8: Dash-8 High Reliability (non-compliant)
- -9: -40°C to +85°C
- /883: -55°C to +125°C, Fully Compliant to MIL-STD-883, Class B/QML

HARRIS PRODUCT CODE EXAMPLE

H IN 230 I J

PREFIX
H: Harris

FAMILY
IN: Interface

PART NUMBER

TEMPERATURE
- C: Commercial, 0°C to +70°C
- I: Industrial, -40°C to +85°C
- M: Military/883, -55°C to +125°C

PACKAGE
- A: Shrink Small Outline, SSOP
- B: Small Outline, SOIC
- C: TSOP
- D: Side Brazed DIP
- F: Flatpack
- G: Pin Grid Array
- J: Ceramic DIP
- L: LCC
- M: PLCC
- N: MQFP
- P: Plastic DIP
- Q: PQFP
- S: SIP
- T: Can (Header)
- W: Wafer
- X: Dice (Military Visual)
- Y: Dice (Commercial Visual)
- Z: Hermetic Gull Wing

ICL/ICM/LM

Device Family Prefixes

PREFIX	DEVICE FAMILY
ICL	Linear IC
ICM	Microperipheral IC
LM	National Semiconductor Alternate Source

Temperature Range Designators

SUFFIX	TEMPERATURE RANGE
C	Commercial: 0°C to +70°C
I	Industrial: Either -25°C to +85°C or -40°C to +85°C (Specified on Datasheet)
M	Military: -55°C to +125°C

Package Type Designators

SUFFIX	PACKAGE
B	Small Outline IC (SOIC)
J	Ceramic Dual-In-Line
P	Plastic Dual-In-Line
T	TO-99, TO-100

Pin Count Designator

SUFFIX	PIN COUNT	DIAMETER
A	8	
B	10	
C	12	
D	14	
E	16	
V	8	0.200″ pin circle, isolated case

Pin Count Designator (Continued)

SUFFIX	PIN COUNT	DIAMETER
W	10	0.230″ pin circle, isolated case
X	10	0.230″ pin circle, case to pin 5
Y	8	0.200″ pin circle, case to pin 4
Z	8	0.230″ pin circle, case to pin 5

PART NUMBERING SYSTEM

All Part Numbers consist of a Device Family Prefix, a Basic Numeric Part Number, and an Option Suffix, as follows:

1, 2 or 3 Digit Prefix	3, 4 or 5 Digit Unique Device Number		3 or 4 Digit Option Suffix				High Reliability Designator
XXX	XXX	X	X	X	X	X	/XXXX

- Pin Count Designator
- Package Type Designator
- Temperature Range Designator
- Electrical Option Designator Only. Used if more than one electrical option is available.
- Variation of basic device type designator. Only used if more than one basic device is available.
- 3 or 4 digit basic device type part number
- Device family prefix

Prefix Device Suffix

ICL 7106 J C D L /883B

DEVICE FAMILY

BASIC DEVICE TYPE

ELECTRICAL OPTION

TEMPERATURE RANGE
- C: Commercial, 0°C to +70°C
- I: Industrial, -25°C to +85°C or -40°C to +85°C (Specified on Data Sheet
- M: Military, -55°C to +125°C
- E: Extended Process Flow for DG4XX

PACKAGE
- B: Small Outline, SOIC
- D: Ceramic Side-Brazed DIP (SBDIP)
- F: Ceramic Flatpack
- I: 16 Pin (0.6 x 0.7 Pin Spacing) Hermetic Hybrid DIP
- J: CERDIP Dual-In-Line
- L: Leadless Ceramic Quad Pack
- M: Plastic Quad Pack (PQFP)
- P: Plastic Dual-In-Line
- S: TO-52
- T: TO-5 (Also TO-78, TO-99, TO-100)
- U: TO-72 (Also TO-18, TO-71)
- Z: TO-92
- /W: Wafer
- /D: DICE

HIGH RELIABILITY DESIGNATOR
- /883B: Fully Compliant to MIL-STD-883 Class B/QML

NUMBER OF PINS

Pin Count Designators

SUFFIX	NUMBER OF PINS
A	8
B	10
C	12
D	14
E	16
F	22
G	24
H	42
I	28
J	32
K	35
L	40
N	18
P	20
R	3
W	10 (0.230″ Pin Circle, Isolated Case)
44	44

EXCEPTIONS TO PACKAGE TYPE DESIGNATOR

DG (ANALOG SWITCH AND MUX) SERIES
- A: 10 Pin Metal Can
- L: 14 Pin Flatpack
- P: Ceramic Side-Brazed DIP (SBDIP) (special order only)
- K: CERDIP
- Y: SOIC
- Y-T: Tape and Reel

AD (D/A CONVERTER) SERIES
- H: TO-52
- D: CERDIP, Ceramic Dual-In-Line Package
- N: Plastic Dual-In-Line Package
- R: TO-92

I-SERIES NOMENCLATURE GUIDE

IH 5009 M J D /883B

DEVICE FAMILY

BASIC PART NUMBER

TEMPERATURE RANGE
- M: -55°C to +125°C

PACKAGE TYPE DESIGNATOR
- B: SOIC
- D: Ceramic Sidebrazed DIP (SBDIP)
- J: CerDIP Dual-In-Line
- P: Plastic DIP
- T: TO-5 Type (also TO-78, TO-99, TO-100)

HIGH RELIABILITY DESIGNATOR
- /883B: -55°C to +125°C Fully Compliant to MIL-STD-883, Class B/QML
- /HR: -55°C to +125°C, Non-Compliant
- /BI: With Burn-In

PIN COUNT DESIGNATOR
- A: 8
- D: 14
- E: 16
- P: 20
- W: 10 (0.230″ pin circle isolated case)

CA Type

Linear (CA Series)

Linear ICs are available in a wide variety of package designs. These packages are identified by suffix letters indicated in the chart below. When ordering Linear devices, it is important that the appropriate suffix letter be affixed to the type number as indicated on the price schedule.

PACKAGE	CA SERIES
Dual-In-Line Ceramic Sidebraze (SBDIP)	D
Dual-In-Line Plastic	E
Frit-Seal Dual-In-Line Ceramic (CerDIP)	F
Quad-In-Line Plastic	Q
Plastic Lead Chip Carrier	Q
Dual-In-LIne Formed Lead TO-5	S
TO-5 Style Package	T
Small Outline (SOIC) Plastic	M

Extra Value Screening

Linear product with extra value screening has an X added to the standard type number in the price list, and is also branded as such. A white dot will indicate location of Pin 1.

Example:

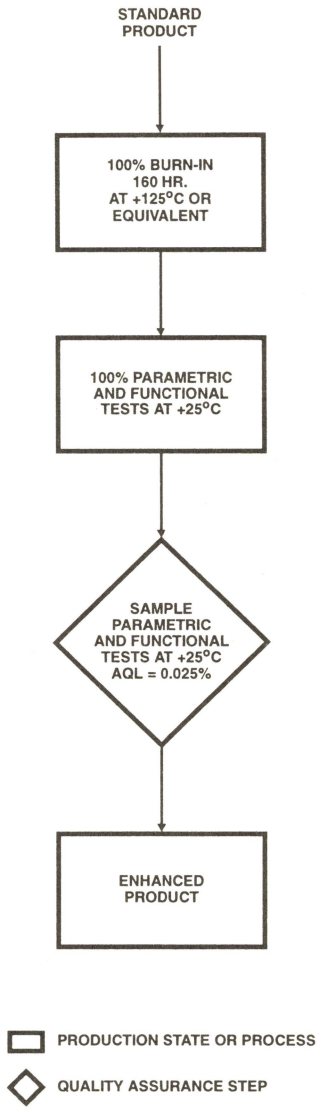
A CA3080E with Extra Value screening is designated CA3080EX in the price list. It is branded CA3080EX plus a white dot at pin number 1.

Tape and Reel for Small Outline Packages

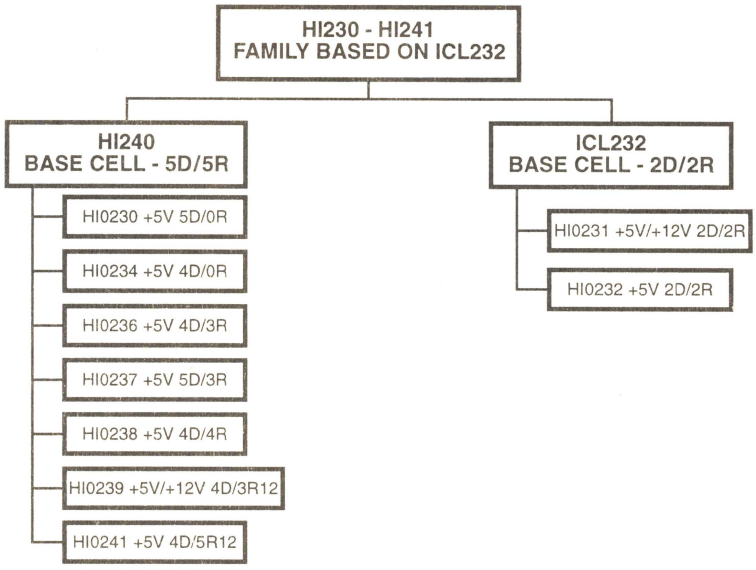
With the introduction of small outline packages, Harris now offers its customers the convenient tape and reel style packaging. Small outline devices, which can be tape and reeled, are denoted with the suffix "M96" or "AM96" in the linear and high speed logic product lines. Devices must be ordered in multiples of quantities listed below. Any returns must be full and unopened reels.

LEAD COUNT	TAPE WIDTH (mm)	REEL SIZE (INCHES)	DEVICES PER REEL
8	12	13	2500
14	16	13	2500
16	16	13	2500
24	24	13	1000

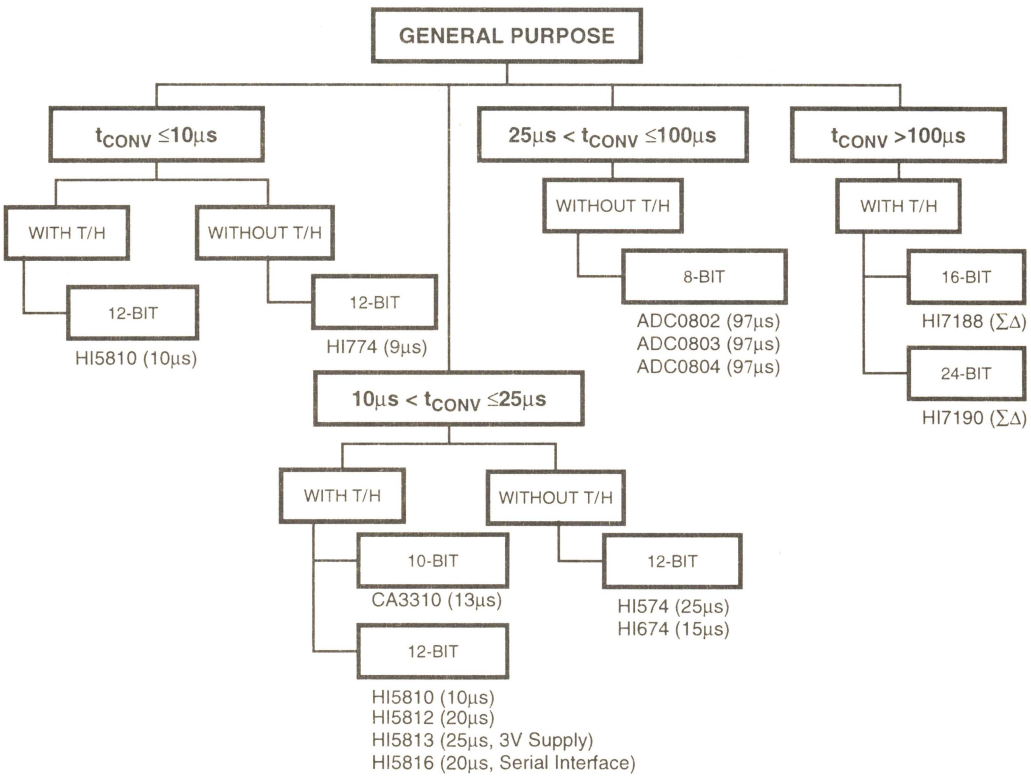
PRODUCT FLOW



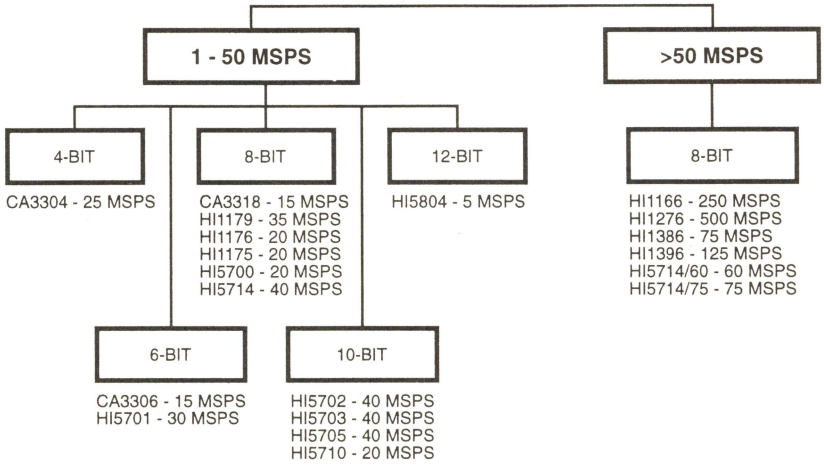
Data Acquisition Selection Trees



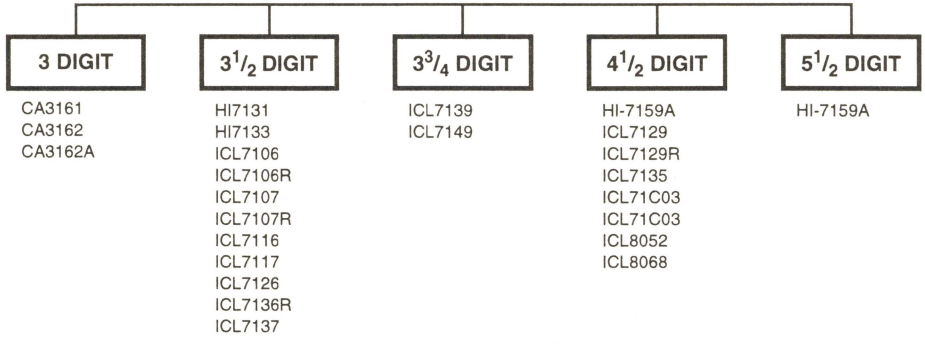
A/D CONVERTERS



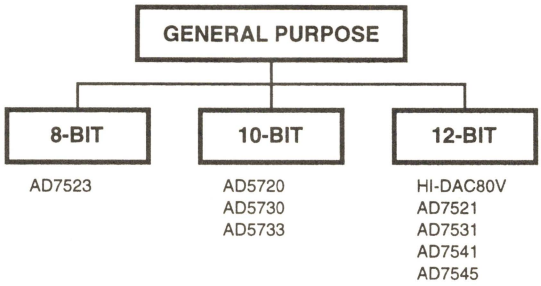
HIGH SPEED A/D CONVERTERS



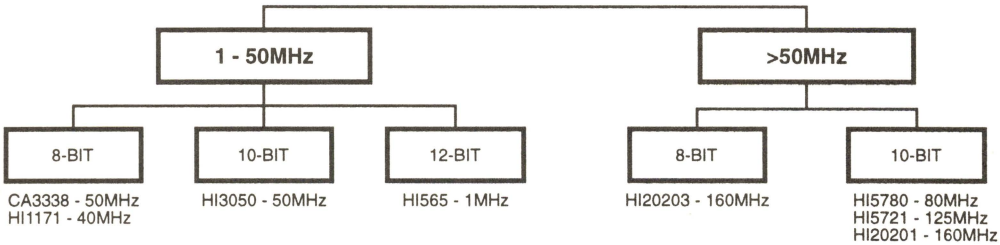
A/D CONVERTERS WITH DISPLAY OUTPUTS

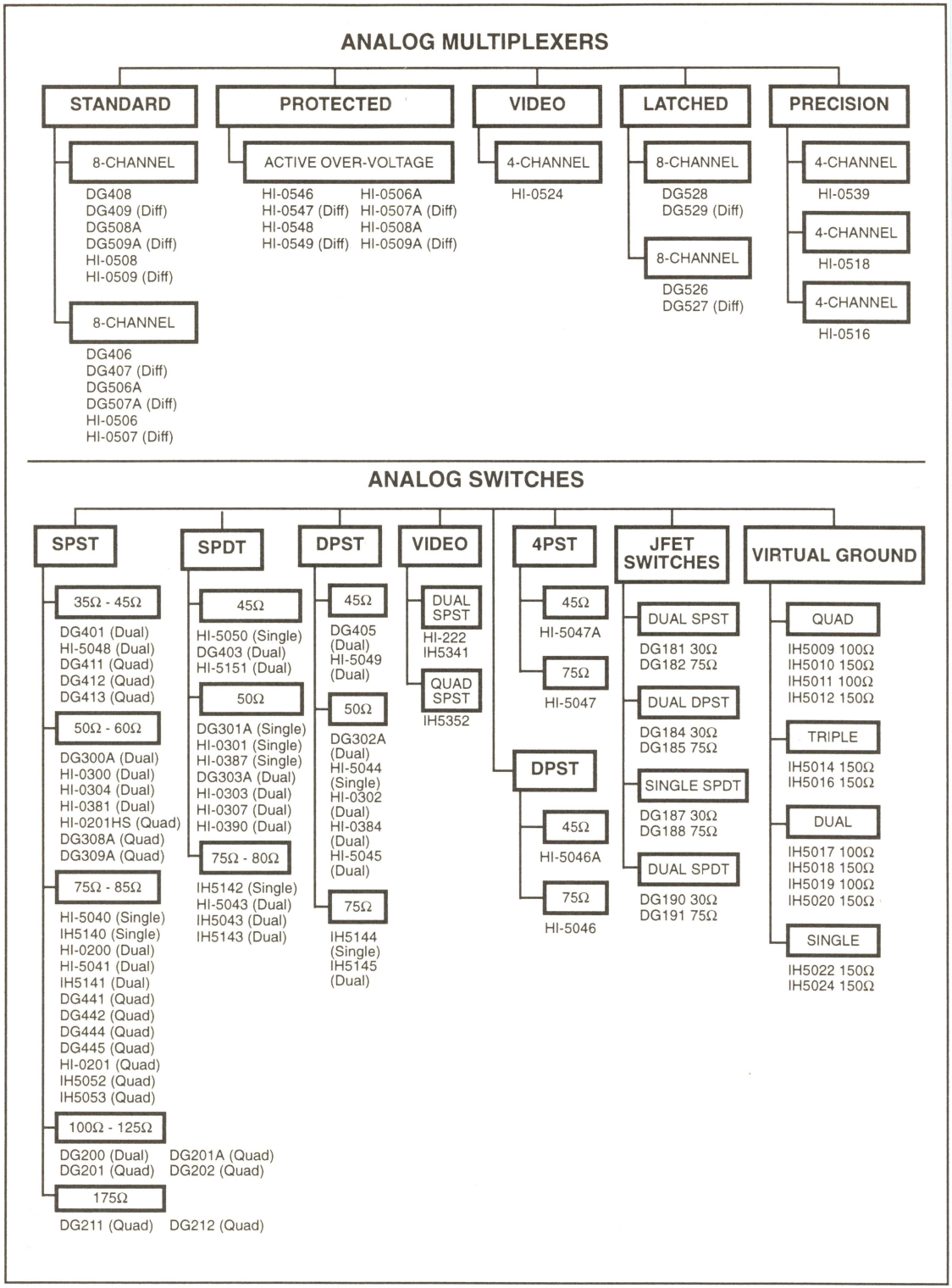


D/A CONVERTERS



HIGH SPEED D/A CONVERTERS




ANALOG MULTIPLEXERS
STANDARD
8-CHANNEL
DG408
DG409 (Diff)
DG508A
DG509A (Diff)
HI-0508
HI-0509 (Diff)
8-CHANNEL
DG406
DG407 (Diff)
DG506A
DG507A (Diff)
HI-0506
HI-0507 (Diff)
PROTECTED
ACTIVE OVER-VOLTAGE
HI-0546
HI-0547 (Diff)
HI-0548
HI-0549 (Diff)
HI-0506A
HI-0507A (Diff)
HI-0508A
HI-0509A (Diff)
VIDEO
4-CHANNEL
HI-0524
LATCHED
8-CHANNEL
DG528
DG529 (Diff)
8-CHANNEL
DG526
DG527 (Diff)
PRECISION
4-CHANNEL
HI-0539
4-CHANNEL
HI-0518
4-CHANNEL
HI-0516
ANALOG SWITCHES
SPST
35Ω - 45Ω
DG401 (Dual)
HI-5048 (Dual)
DG411 (Quad)
DG412 (Quad)
DG413 (Quad)
50Ω - 60Ω
DG300A (Dual)
HI-0300 (Dual)
HI-0304 (Dual)
HI-0381 (Dual)
HI-0201HS (Quad)
DG308A (Quad)
DG309A (Quad)
75Ω - 85Ω
HI-5040 (Single)
IH5140 (Single)
HI-0200 (Dual)
HI-5041 (Dual)
IH5141 (Dual)
DG441 (Quad)
DG442 (Quad)
DG444 (Quad)
DG445 (Quad)
HI-0201 (Quad)
IH5052 (Quad)
IH5053 (Quad)
100Ω - 125Ω
DG200 (Dual)
DG201 (Quad)
DG201A (Quad)
DG202 (Quad)
175Ω
DG211 (Quad)
DG212 (Quad)
SPDT
45Ω
HI-5050 (Single)
DG403 (Dual)
HI-5151 (Dual)
50Ω
DG301A (Single)
HI-0301 (Single)
HI-0387 (Single)
DG303A (Dual)
HI-0303 (Dual)
HI-0307 (Dual)
HI-0390 (Dual)
75Ω - 80Ω
IH5142 (Single)
HI-5043 (Dual)
IH5043 (Dual)
IH5143 (Dual)
DPST
45Ω
DG405 (Dual)
HI-5049 (Dual)
50Ω
DG302A (Dual)
HI-5044 (Single)
HI-0302 (Dual)
HI-0384 (Dual)
HI-5045 (Dual)
75Ω
IH5144 (Single)
IH5145 (Dual)
VIDEO
DUAL SPST
HI-222
IH5341
QUAD SPST
IH5352
4PST
45Ω
HI-5047A
75Ω
HI-5047
DPST
45Ω
HI-5046A
75Ω
HI-5046
JFET SWITCHES
DUAL SPST
DG181 30Ω
DG182 75Ω
DUAL DPST
DG184 30Ω
DG185 75Ω
SINGLE SPDT
DG187 30Ω
DG188 75Ω
DUAL SPDT
DG190 30Ω
DG191 75Ω
VIRTUAL GROUND
QUAD
IH5009 100Ω
IH5010 150Ω
IH5011 100Ω
IH5012 150Ω
TRIPLE
IH5014 150Ω
IH5016 150Ω
DUAL
IH5017 100Ω
IH5018 150Ω
IH5019 100Ω
IH5020 150Ω
SINGLE
IH5022 150Ω
IH5024 150Ω

CLOCKS/COUNTERS

TIMER/COUNTERS WITH DISPLAY DRIVERS

ICM7217
ICM7217A
ICM7217B
ICM7217C
ICM7224
ICM7225
ICM7249
ICM7208
ICM7216A
ICM7216B
ICM7216C
ICM7216D
ICM7226A
ICM7226B

DISPLAY DRIVERS

ICM7211
ICM7211A
ICM7211M
ICM7211AM
ICM7212
ICM7212A
ICM7212M
ICM7212AM
ICM7218A
ICM7218B
ICM7218C
ICM7218D
ICM7218E
ICM7228A
ICM7228B
ICM7228C
ICM7228D
ICM7231A
ICM7231B
ICM7231C
ICM7232A
ICM7232B
ICM7232C
ICM7243A
ICM7243B
CA3161
CA3168

REAL-TIME CLOCKS

CDP1879
CDP6818A
CDP68HC68T1
CDP6818
ICM7170

TIMERS/OSCILLATORS

CA555
ICM7555
ICM7556
ICM7242
HA7210

TIMER/COUNTERS

CDP1878
82C54
CDP68HC68W1

ANALOG TO DIGITAL CONVERTERS WITH DISPLAY OUTPUTS

(NOTES 2, 3) DEVICE	SUFFIX CODES	DISPLAY TYPE	DISPLAY DRIVE	CONVERSION TYPE	CONVERSION TIME µs	TECHNOLOGY	RANGE MIN	LINEARITY COUNTS	FEATURES
3 DIGIT WITH LED DRIVERS									
CA3162A	E	BCD	Common Anode	Integrating	10, 250	Bipolar-JI	+999mV to -99mV	±1	BCD to 7 Segment Converter, 2 Chip Set Makes a Complete DPM. Analog to Digital Converter, 3 Digit Output, "EEE": Positive Over-Range Indication, "-": Negative Over-Range Display.
CA3162	E, EX	BCD	Common Anode	Integrating		Bipolar-JI	+999mV to -99mV	±1	
$3^1/_2$ DIGIT WITH LED/LCD DRIVERS									
HI7131	CM44	LCD	Direct Drive	Auto-Zero Integrating	333 Typ	CMOS-JI	±0.2V	±1	High Common Mode Front End No Over-Range Hangover
HI7131	CPL	LCD	Direct Drive	Auto-Zero Integrating	333 Typ	CMOS-JI	±0.2V	±1	
HI7133	CM44	LED	Common Anode	Auto-Zero Integrating	333 Typ	CMOS-JI	±0.2V	±1	High Common Mode Front End No Over-Range Hangover
HI7133	CPL	LED	Common Anode	Auto-Zero Integrating	333 Typ	CMOS-JI	±0.2V	±1	
ICL7106	CM44	LCD	Direct Drive	Auto-Zero Integrating	333 Typ	CMOS-JI	±0.2V	±1	Low Cost, MQFP
ICL7106	CPL	LCD	Direct Drive	Auto-Zero Integrating	333 Typ	CMOS-JI	±0.2V	±1	
ICL7106R	CPL	LCD	Direct Drive	Auto-Zero Integrating	333 Typ	CMOS-JI	±0.2V	±1	Low Cost, PDIP Reversed Leads
ICL7107	CM44	LED	Common Anode	Auto-Zero Integrating	333 Typ	CMOS-JI	±0.2V	±1	Low Cost, MQFP
ICL7107	CPL	LED	Common Anode	Auto-Zero Integrating	333 Typ	CMOS-JI	±0.2V	±1	
ICL7107R	CPL	LED	Common Anode	Auto-Zero Integrating	333 Typ	CMOS-JI	±0.2V	±1	Low Cost, PDIP Reversed Leads
ICL7116	CM44	LCD	Direct Drive	Auto-Zero Integrating	333 Typ	CMOS-JI	±0.2V	±1	ICL7106 with Display Hold Function, MQFP
ICL7116	CPL	LCD	Direct Drive	Auto-Zero Integrating	333 Typ	CMOS-JI	±0.2V	±1	

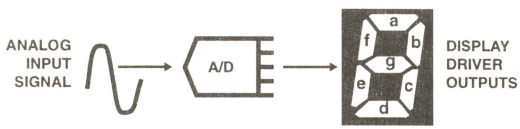
ANALOG TO DIGITAL CONVERTERS WITH DISPLAY OUTPUTS (Continued)

(NOTES 2, 3) DEVICE	SUFFIX CODES	DISPLAY TYPE	DISPLAY DRIVE	CONVERSION TYPE	CONVERSION TIME µs	TECHNOLOGY	RANGE MIN	LINEARITY COUNTS	FEATURES
ICL7117	CPL	LCD	Direct Drive	Auto-Zero Integrating	333 Typ	CMOS-JI	±0.2V	±1	ICL7107 with Display Hold Function
ICL7136	CM44	LCD	Direct Drive	Auto-Zero Integrating	333 Typ	CMOS-JI	±0.2V	±1	Low Power Version of ICL7106, MQFP
ICL7136	CPL	LCD	Direct Drive	Auto-Zero Integrating	333 Typ	CMOS-JI	±0.2V	±1	
ICL7136R	CPL	LCD	Direct Drive	Auto-Zero Integrating	333 Typ	CMOS-JI	±0.2V	±1	Low Power Version of ICL7106 Reversed Leads
ICL7137	CPL	LED	Common Anode	Auto-Zero	333 Typ	CMOS-JI	±0.2V	±1	Low Power Version of ICL7107
$3^3/_4$ DIGIT WITH LCD DRIVERS									
ICL7139	CPL	LCD	Duplex	Auto Zero	400	CMOS-JI	±0.4V	±1	13 Ranges, Autoranging Multimeter, AC Internal
ICL7149	CM44	LCD	Duplex	Auto-Zero Integrating	400	CMOS-JI	±0.4V	±1	18 Ranges, Autoranging Multimeter, AC External, MQFP
ICL7149	CPL	LCD	Duplex	Auto-Zero Integrating	400	CMOS-JI	±0.4V	±1	
$4^1/_2$ DIGIT WITH LCD DRIVERS									
ICL7129	CM44	LCD	Triplexed	Auto-Zero Integrating	500	CMOS-JI	±0.2V	±1 Typ	10µV Resolution. 1X, 10X Range Selection, MQFP
ICL7129	CPL	LCD	Triplexed	Auto-Zero Integrating	500	CMOS-JI	±0.2V	±1 Typ	
ICL7129R	CPL	LCD	Triplexed	Auto-Zero Integrating	500	CMOS-JI	±0.2V	±1 Typ	10µV Resolution. 1X, 10X Range Selection, PDIP Reversed Leads

ANALOG TO DIGITAL CONVERTERS WITH DISPLAY OUTPUTS

PART NUMBER	OUTPUT TYPE	RESOLUTION	CONVERSION TIME (SAMPLE RATE)	PACKAGE TYPES	FEATURES
CA3162 CA3161	LED, CA, BCD	3 Digits	10ms/250ms (96SPS/4SPS)	16 Lead Plastic DIP	BCD to 7 Segment Converter, 2 Chip Set Makes a Complete DPM A/D Converter, 3 Digit Output, "EEE": Positive Over-Range Indication, "-": Negative Over-Range Display
ICL7126	LCD, DD	$3\frac{1}{2}$ Digits	333ms (3SPS)	40 Lead Plastic DIP	Low Power Version of ICL7106 **Not Recommended for New Designs** (See ICL7136)
ICL7135	MUXED BCD	$4\frac{1}{2}$ Digits	250ms (4SPS)	28 Lead Plastic DIP	100µV Resolution, Differential Inputs
ICL71C03	MUXED BCD	$4\frac{1}{2}$ Digits	333ms (3SPS)	28 Lead Plastic DIP	2 Chip Set, Low Leakage 50pA Max
ICL8052				14 Lead Plastic DIP, 14 Lead SBDIP, 14 Lead CerDIP	
ICL71C03	MUXED BCD	$4\frac{1}{2}$ Digits	333ms (3SPS)	28 Lead Plastic DIP	2 Chip Set, Low Noise 2µV Typ
ICL8068				14 Lead SBDIP, 14 Lead CerDIP	
HI-7159A	MUXED BCD	$5\frac{1}{2}$ Digits (18-Bits)	67ms (15SPS)	28 Lead Plastic DIP	Integrating Type, $5\frac{1}{2}$ Digits or $4\frac{1}{2}$ Digits Modes, 10µV Resolution
		$4\frac{1}{2}$ Digits (18-Bits)	17ms (60SPS)		

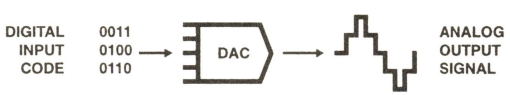
NOTE: Sorted by ascending resolution (Digits) and conversion time.



DIGITAL TO ANALOG CONVERTERS

PART NUMBER	RESOLUTIONS (BITS)	CONVERSION TIME (SAMPLE RATE)	POWER SUPPLY REQUIREMENTS	PACKAGE TYPES	TEMP RANGE	FEATURES
CA3338	8	20ns (Typ) (50 MSPS)	+5V at 25mA (Dynamic)	16 Lead Plastic DIP, 16 Lead SBDIP, 16 Lead SOIC	IND, MIL	Video Speed, Voltage Output 2 Performance, Grades, External Reference
AD7523	8	200ns (Max) (5 MSPS)	+5V to +16V at 2.5mA (Excl I Ladder)	16 Lead Plastic DIP	COM	Second Source, 3 Performance Grades, External Reference, Current Output
HI1171	8	40MHz	+5.0V	24 Lead SOIC	COM	Low Power
HI20203	8	160MHz	-5.2V	28 Lead Plastic DIP, 23 Lead SOIC	COM	ECL
AD7520, AD7530	10	500ns (Typ) (2 MSPS)	+5V to +15V at 2mA (Excl I Ladder)	16 Lead Plastic DIP, 16 Lead CerDIP	COM, MIL	Second Source, 3 Performance Grades, External Reference, Current Output
AD7533	10	800ns (Max) (1.25 MSPS)	+5V to +16V at 2.5mA (Excl I Ladder)	16 Lead Plastic DIP	COM	Second Source, Low Cost, External Reference, Current Output
HI20201	10	160MHz	-5.2V	23 Lead Plastic DIP, 23 Lead SOIC	COM	ECL
HI3050	10	50MHz	+5.0V	64 Lead PQFP	COM	Triple Data Acquisition for RGB Applications
HI5721	10	125MHz	+5.0V to -5.2V	28 Lead SOIC, 23 Lead Plastic DIP	IND	High Speed, 100K DAC for Communications Applications
HI-565A	12	250ns(Max) (4 MSPS)	±15 at +12mA/ -15mA	24 Lead SBDIP	COM, MIL	Industry Standard, DI Process, Internal Reference, Current Output
AD7521, AD7531	12	500ns (Typ) (2 MSPS)	+5V to +15V at 2mA (Excl I Ladder)	18 Lead Plastic DIP	COM	12-Bit Versions of AD7520, AD7530
AD7541	12	1µs (Max) (1 MSPS)	+5V to +16V at 2mA (Excl I Ladder)	18 Lead Plastic DIP	COM	Second Source, External Reference, Current Output
HI-DAC80V	12	1.5µs (Typ) (667 KSPS)	±12V to ±15V at +15mA/ -20mA	24 Lead Plastic DIP	COM	Second Source, Low Cost, DI Process, Voltage Output, Internal Reference
HI-DAC85V	12	1.5µs (Typ) (667 KSPS)	±12V to ±15V at +15mA/ -20mA	24 Lead Plastic DIP	IND	Second Source, Low Cost, DI Process, Voltage Output, Internal Reference
AD7545	12	2µs (Max) (500 KSPS)	+5V to +16V at 2mA	20 Lead Plastic DIP	COM, IND, MIL	Second Source, External Reference, Current Output

NOTE: Sorted by ascending resolution (Bits) and conversion time.



4-BIT FLASH A/D CONVERTER

DEVICE	SUFFIX CODE	OUTPUTS	CONVERSION	CONVERSION TIME (ns)	TECHNOLOGY	RANGE MIN (V)	INL (LSB)	DNL (LSB)	FEATURES
CA3304A	D	Parallel, Binary, 4-Bit Latch, Three-State	Flash	40	CMOS-S.O.S.	2.0	±0.125	±0.125	Low Power - 25mW Typ at 25 MSPS
CA3304A	E						±0.125	±0.125	
CA3304	D						±0.25	±0.25	
CA3304	E						±0.25	±0.25	

6-BIT FLASH A/D CONVERTER

DEVICE	SUFFIX CODE	MIL SPEC	OUTPUTS	CONVERSION	CONVERSION TIME (ns)	TECHNOLOGY	RANGE MIN (V)	INL (LSB)	DNL (LSB)	FEATURES
CA3306A	D		Parallel, Binary, 6-Bit Latch, Three-State	Flash	67	CMOS-S.O.S.	5.0	±0.25	±0.25	Low Power - 70mW Typ at 15 MSPS, 1kΩ Ladder Resistance, Replaces Micropower MP7682
CA3306A	E				67			±0.25	±0.25	
CA3306	D				67			±0.5	±0.5	
CA3306	E				67			±0.5	±0.5	
CA3306	M				67			±0.5	±0.5	
CA3306	J3				100			±0.5	±0.5	
CA3306C	D				100			±0.5	±0.5	
CA3306C	E				100			±0.5	±0.5	
CA3306C	M				100			±0.5	±0.5	
CA3306C	J3				100			±0.5	±0.5	
HI3-5701K	-5	HI1-5701T/883			33	CMOS-JI	4.0	±1.25	±0.6	Low cost MP7682 Second Source
HI9P5701K	-5	HI1-5701T/883			33			±1.25	±0.6	
HI3-5701B	-9	HI1-5701T/883			33			±1.25	±0.6	
HI9P5701B	-9	HI1-5701T/883			33			±1.25	±0.6	

8-BIT FLASH A/D CONVERTER

DEVICE	SUFFIX CODE	MIL SPEC	OUTPUTS	CONVERSION	CONVERSION TIME (ns)	BAND WIDTH (MHz)	TECHNOLOGY	RANGE MIN (V)	INL (LSB)	DNL (LSB)	FEATURES
CA3318C	D		Parallel, Binary, 3-Bit Latch, Three-State	Flash	67	2.5	CMOS-S.O.S.	6.4	±1.0	±1.0 - 0.8	Lowest Power 8-Bit Flash
CA3318C	E				67	2.5	CMOS-S.O.S.	6.4	±1.5	±1.0 - 0.8	
CA3318C	M				67	2.5	CMOS-S.O.S.	6.4	±1.5	±1.0 - 0.8	
HI3-5700J	-5	HI1-5700S/883			50	18	CMOS-JI	4	±2.0	±0.9	MP7684 Second Source Industrial Temp.
HI9P5700J	-5	HI1-5700S/883			50	18	CMOS-JI	4	±2.0	±0.9	
HI3-5700A	-9	HI1-5700S/883			50	18	CMOS-JI	4	±2.0	±0.9	
HI9P5700A	-9	HI1-5700S/883			50	18	CMOS-JI	4	±2.0	±0.9	
HI1386JCP			Parallel, Binary, 8-Bit Latch		13	150	Bipolar	2	±0.5	±0.5	High Performance Low Power 580mW Typ at 75 MSPS
HI1386AIL					13	150	Bipolar	2	±0.5	±0.5	
HI1396JCJ					8	200	Bipolar	2	±0.5	±0.5	High Performance Low Power 870mW Typ at 125 MSPS
HI1396AIL					8	200	Bipolar	2	±0.5	±0.5	
HI1396JCP					8	200	Bipolar	2	±0.5	±0.5	
HI1166AIL					4	250	Bipolar	2	±0.5	±0.5	High Performance Low Power 1.4W Typ at 250 MSPS
HI1276AIL					2.5	300	Bipolar	2	±0.5	±0.5	High Performance Low Power 2.2W Typ at 500 MSPS

8-BIT SUBRANGING A/D CONVERTER

DEVICE	SUFFIX CODE	MIL SPEC	OUTPUTS	CONVERSION TYPE	CONVERSION TIME (ns)	BANDWIDTH (MHz)	TECHNOLOGY	RANGE MIN (V)	INL (LSB)	DNL (LSB)	FEATURES
HI1175JCB HI1175JCP			Parallel, Binary, 8-Bit Latch, Three-State	Two-Step	50	18	CMOS	2	±1.3	±0.5	Low Power 60mW Typ at 20 MSPS Internal Reference
HI1176JCQ			Parallel, Binary, 8-Bit Latch, Three-State	Two-Step	50	18	CMOS	2	±1.3	±0.5	Low Power 60mW Typ at 20 MSPS DC Restore Internal Reference
HI1179JCQ			Parallel, Binary, 8-Bit Latch, Three-State	Two-Step	30	60	CMOS	2	+1.3 -1.0	±0.5	Low Power 80mW Typ at 35 MSPS DC Restore Internal Reference
HI5714/40CB			Parallel, Binary	Two-Step Folding	25ns	15	HBC10	2	±0.75	±0.5	ENOB = 7.8 Bits
HI5714/60CB					16ns	15	HBC10	2	±0.75	±0.5	High ENOB = 7.7 Bits
HI5714/75CB					13ns	15	HBC10	2	±0.75	±0.5	ENOB = 7.7 Bits

10-BIT SUBRANGING A/D CONVERTER

DEVICE	SUFFIX CODE	MIL SPEC	OUTPUTS	CONVERSION TYPE	CONVERSION TIME (µs)	TECHNOLOGY	RANGE MIN (V)	LINEARITY (LSB)	CLOCK TYP	FEATURES
HI5703KCB			Offset Binary, 2's Complement	Pipeline	25ns	BiCMOS	1.25	+1.5	1-40MSPS	Track and Hold, 400mW, +5V, 9+ ENOB
HI5702JCB			Offset Binary, 2's Complement	Pipeline	28ns	BiCMOS	1.25	±1.5	1-40 MSPS	Track and Hold, 600mW, +5V, 9+ ENOB
HI5702KCB					25ns					
HI5710JCQ			Offset Binary, 2's Complement	2 Step Flash	50ns	CMOS	2	±1.0	0.5-20 MSPS	Track and Hold, 140mW, +5V
HI5705KCB			Offset Binary, 2's Complement	Pipeline	25ns	BiCMOS	1.25	+1.5	1-40MSPS	Low Cost A/D

12-BIT SUBRANGING A/D CONVERTER

DEVICE	SUFFIX CODE	MIL SPEC	OUTPUTS	CONVERSION TYPE	CONVERSION TIME (ns)	TECHNOLOGY	RANGE MIN (V)	INL (LSB)	REFERENCE VOLTAGE	FEATURES
HI5800BID			Parallel, Binary, Three-State, 8-Bit Bus,12-Bit Bus and 16-Bit Bus	Two-Step	330ns	BiCMOS	5	±1.0	Internal 2.5V	High Performance Sampling A/D, System +11.5 ENOB, V_{REF} Sampling and Hold, 20MHz BW
HI5800JCD								±2.0		
HI5800KCD								±1.0		
HI5804KCB				Pipeline	200ns	BiCMOS	2.3V	±2.0	Internal	-100MHz BW

8-BIT SUCCESSIVE APPROXIMATION A/D CONVERTER

DEVICE	SUFFIX CODE	MIL SPEC	OUTPUTS	CONVERSION TYPE	CONVERSION TIME (ns)	TECHNOLOGY	RANGE MIN (V)	INL (LSB)	REFERENCE VOLTAGE	FEATURES
ADC0802LCN			8-Bit Three-State	Successive Approximation	<100µs	CMOS	0	$\pm^1/_2$	5	80C48 and 80C80/85 Bus Compatible - No Interfacing Logic Required, Conversion Time <100µs, Easy Interface to Most Microprocessors, Will Operate in a "Stand Alone" Mode, Differential Analog Voltage Inputs, Works with Bandgap Voltage References, TTL Compatible Inputs and Outputs, On-Chip Clock Generator, 0V to 5V Analog Voltage Input Range (Single +5V Supply), No Zero-Adjust Required
ADC0802LCD								$\pm^3/_4$		
ADC0802LD								±1		
ADC0803LCN								$\pm^1/_2$		
ADC0803LCD								$\pm^3/_4$		
ADC0802LCWM								±1		
ADC0803LD								±1		
ADC0804LCN								±1		
ADC0804LCD								±1		

10-BIT SUCCESSIVE APPROXIMATION A/D CONVERTER

DEVICE	SUFFIX CODE	MIL SPEC	OUTPUTS	CONVERSION TYPE	CONVERSION TIME (ns)	TECHNOLOGY	RANGE MIN (V)	INL (LSB)	REFERENCE VOLTAGE	FEATURES
CA3310E			10-Bit Microprocessor Compatible	Successive Approximation	13µs	CMOS	3	±0.75		CMOS Low Power (15mW Typ), Single Supply Voltage (3V to 6V), 13µs Conversion Time, Built-In Track and Hold, Rail-to-Rail Input Range, Latched Three-State Output Drivers, Microprocessor-Compatible Control Lines, Internal or External Clock
CA3310AE								±0.5		
CA3310M								±0.75		
CA3310AM								±0.5		
CA3310D								±0.75		
CA3310AD								±0.5		

12-BIT SUCCESSIVE APPROXIMATION A/D CONVERTER

DEVICE	SUFFIX CODE	MIL SPEC	OUTPUTS	CONVERSION TYPE	CONVERSION TIME (ns)	TECHNOLOGY	RANGE MIN (V)	INL (LSB)	REFERENCE VOLTAGE	FEATURES
HI5810JIP			12-Bit Latched Three-State	Successive Approximation	10µs	CMOS	3	±2.5		10µs Conversion Time, 100 KSPS Throughput Rate, Built-In Track and Hold, Single +5V Supply Voltage, 40mW Maximum Power Consumption, Internal or External Clock, 1MHz Input Bandwidth -3dB
HI5810KIP								±2.0		
HI5810JIB								±2.5		
HI5810KIB								±2.0		
HI5810JIJ								±2.5		
HI5810KIJ								±2.0		
HI5812JIP			12-Bit Latched Three-State	Successive Approximation	20µs	CMOS	3	±1.5		20µs Conversion Time, 50 KSPS Throughput Rate, Built-In Track and Hold, Single +5V Supply Voltage, 25mW Maximum Power Consumption, Internal or External Clock
HI5812KIP								±1.0		
HI5812JIB								±1.5		
HI5812KIB								±1.0		
HI5812JIJ								±1.5		
HI5812KIJ								±1.0		
HI5813JIP			12-Bit Latched Three-State	Successive Approximation	25µs	CMOS	3	±4.0		
HI5813KIP								±2.5		
HI5813JIB								±4.0		
HI5813KIB								±2.5		
HI5813JIJ								±4.0		
HI5813KIJ								±2.5		

12-BIT SUCCESSIVE APPROXIMATION A/D CONVERTER (Continued)

DEVICE	SUFFIX CODE	MIL SPEC	OUTPUTS	CONVERSION TYPE	CONVERSION TIME (ns)	TECHNOLOGY	RANGE MIN (V)	INL (LSB)	REFERENCE VOLTAGE	FEATURES
HI5816KIP			12-Bit Latched Three-State	Successive Approximation	20µs	CMOS	3	±0.75		Serial Interface
HI5816KIA								±0.75		
HI5816KIB								±0.75		
HI3-574AJN	-5		8, 12, or 16-Bit Three-State Digital Interface for Micropro-cessor Control	Successive Approximation	25µs	CMOS	12	±1.0	10	Complete 12-Bit A/D Converter with Reference and Clock, Full 8-, 12- or 16-Bit Microprocessor Bus Interface 150ns Bus Access Time, No Missing Codes Over Temperature, Minimal Setup Time for Control Signals, 25µs Max Conversion Times, Low Noise, via Current-Mode Signal Transmis-sion Between Chips, Byte Enable/ Short Cycle (A_O Input), Guaranteed Break-Before-Make Action, Eliminat-ing Bus Contention During Read Op-eration. Latched by Start Convert Input (To Set the Conversion Length), ±12V to ±15V Operation
HI3-574AKN	-5							±0.5		
HI3-574ALN	-5							±0.5		
HI1-574AJD	-5							±1.0		
HI1-574AKD	-5							±0.5		
HI1-574ALD	-5							±0.5		
HI1-574ASD	-2	HI1-574ASD/883						±1.0		
HI1-574ATD	-2	HI1-574ATD/883						±0.5		
HI1-574AUD	-2	HI1-574AUD/883						±0.5		
		HI4-574ASE/883						±1.0		
		HI4-574ATE/883						±0.5		
		HI4-574AUE/883						±0.5		
HI3-674AJN	-5		8, 12, or 16-Bit Three-State Digital Interface for Micropro-cessor Control	Successive Approximation	15µs	CMOS	12	±1.0	10	Complete 12-Bit A/D Converter with Reference and Clock, Full 8-, 12- or 16-Bit Microprocessor Bus Interface, 150ns Bus Access Time, No Missing Codes Over Temperature, Minimal Setup Time for Control Signals, 15µs Max Conversion Times, Low Noise, via Current-Mode Signal Transmis-sion Between Chips, Byte Enable/ Short Cycle (A_O Input), Guaranteed Break-Before-Make Action, Eliminat-ing Bus Contention During Read Op-eration. Latched by Start Convert Input (To Set the Conversion Length), ±12V to ±15V Operation
HI3-674AKN	-5							±0.5		
HI3-674ALN	-5							±0.5		
HI1-674AJD	-5							±1.0		
HI1-674AKD	-5							±0.5		
HI1-674ALD	-5							±0.5		
HI1-674ASD	-2	HI1-674ASD/883						±1.0		
HI1-674ATD	-2	HI1-674ATD/883						±0.5		
HI1-674AUD	-2	HI1-674AUD/883						±0.5		
		HI4-674ASE/883						±1.0		
		HI4-674ATE/883						±0.5		
		HI4-674AUE/883						±0.5		

12-BIT SUCCESSIVE APPROXIMATION A/D CONVERTER (Continued)

DEVICE	SUFFIX CODE	MIL SPEC	OUTPUTS	CONVERSION TYPE	CONVERSION TIME (ns)	TECHNOLOGY	RANGE MIN (V)	INL (LSB)	REFERENCE VOLTAGE	FEATURES
HI3-774J	-5		8, 12, or 16-Bit Three-State Digital Interface for Microprocessor Control	Successive Approximation	9µs	CMOS	12	±1.0	10	Complete 12-Bit A/D Converter with Reference and Clock, Full 8-, 12- or 16-Bit Microprocessor Bus Interface 150ns Bus Access Time, No Missing Codes Over Temperature, Minimal Setup Time for Control Signals, 9µs Max Conversion Times, Digital Error Correction (HI-774), Low Noise, via Current-Mode Signal Transmission Between Chips, Byte Enable/Short Cycle (A_0 Input), Guaranteed Break-Before-Make Action, Eliminating Bus Contention During Read Operation. Latched by Start Convert Input (To Set the Conversion Length), ±12V to ±15V Operation
HI3-774K	-5							±0.5		
HI1-774J	-5							±1.0		
HI1-774K	-5							±0.5		
HI1-774L	-5							±0.5		
HI1-774S	-2	HI1-774S/883						±1.0		
HI1-774T	-2	HI1-774T/883						±0.5		
HI1-774U	-2	HI1-774U/883						±0.5		
HI4-774S/883								±1.0		
HI4-774T/883								±0.5		
HI4-774U/883								±0.5		

24-BIT SIGMA DELTA A/D CONVERTER

DEVICE	SUFFIX CODE	MIL SPEC	OUTPUTS	CONVERSION TYPE	CONVERSION TIME (ns)	TECHNOLOGY	RANGE MIN (V)	INL (LSB)	REFERENCE VOLTAGE	FEATURES
HI7190IB HI7190IC			Serial QSPI, SP, I, Microwire	Sigma Delta	10Hz -2kHz	HBC10	±2.5V	$^1/_2$ LSB	+2.5V	Lowest Noise Sigma Delta 23.5 Bit ENOB at 16 Bits Linear, -40°C to +85°C.

DIGITAL TO ANALOG CONVERTERS

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	INL LSB	DNL LSB	SETTLING TIME (µs)	TECHNOLOGY	MULTIPLYING	OUTPUT I/V	INPUT BUFFER	REFERENCE	FEATURES
8-BIT CMOS											
AD7523J	N		$\pm^1/_2$	Monotonic	200 Max	CMOS-JI	X	I	No	External	
AD7523K			$\pm^1/_4$								
AD7523L			$\pm^1/_8$								

DIGITAL TO ANALOG CONVERTERS (Continued)

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	INL LSB	DNL LSB	SETTLING TIME (µs)	TECHNOLOGY	MULTIPLYING	OUTPUT I/V	INPUT BUFFER	REFERENCE	FEATURES
HIGH SPEED 8-BIT											
CA3338A	D	M	$\pm^3/_4$	$\pm^1/_2$	20 Typ	CMOS-SOS		V	Yes	External	8-Bit Video Speed, Low Glitch
	E										
CA3338	D	M	±1	$\pm^3/_4$							
	E										
HI1171	JCB		±1.3	$\pm^1/_4$	25 Typ	CMOS		I	Yes	External	8-Bit Video Speed, Low Glitch, Low Power, Low Cost, 40 MSPS
HI20203	JCB		±1	$\pm^1/_2$	4.3 Typ	CMOS	Yes	I	Yes	External	8-Bit 160MHz D/A with ECL Inputs,Low Glitch, Low Power
	JCP										
HIGH SPEED 10-BIT											
HI5721	BIB BIP		±0.5	±0.5	4.5ns	BiCMOS	Yes	I	Yes	Internal	10-Bit, 125MHz, Low Glitch, Low Power, TTL/CMOS Inputs
HI20201	JCB		±1	$\pm^1/_2$	5.2 Typ	CMOS	Yes	I	Yes	External	10-Bit 160MHz D/A with ECL Inputs, Low Glitch, Low Power
	JCP										
HI3050	JCQ		±2	$\pm^1/_2$	-	CMOS		I	Yes	External	Triple DAC, 50MHz
10-BIT CMOS											
AD7520J	D		±2		500 Typ	CMOS-JI	X	I	No	External	Full Input Static Protection
AD7520J	N		±2								
AD7520K	D		±1								
AD7520K	N		±1								
AD7520L	D		$\pm^1/_2$								
AD7520L	N		$\pm^1/_2$								
AD7520S	D	AD7520SD/883B	±2								
AD7520T	D		±1								
AD7520U	D	AD7520UD/883B	$\pm^1/_2$								

DIGITAL TO ANALOG CONVERTERS (Continued)

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	INL LSB	DNL LSB	SETTLING TIME (μs)	TECHNOLOGY	MULTIPLYING	OUTPUT I/V	INPUT BUFFER	REFERENCE	FEATURES
AD7530J	N		±2		500 Typ	CMOS-JI	X	I	No	External	Full Input Static Protection
AD7530K			±1								
AD7530L			±1/2								
AD7533J	N		±2		800 Max	CMOS-JI	X	I	No	External	Full Input Static Protection
AD7533K			±1								
AD7533L			±1/2								
12-BIT CMOS											
HI3-DAC80V	-5		±1/2	±3/4	1.5 Max	Bipolar		V	No	Internal	Low Cost, Internal Op Amp
HI3-DAC85V	-4, -9		±1/2	±1/2							
HI1-565AJD	-5	HI1-565ASD/883	±1/2	±3/4	0.5 Typ	Bipolar-DI		I	No	Internal	
HI1-565AKD		HI1-565ATD/883	±1/4	±1/2							
HI1-565ASD	-2		±1/2	±3/4							
HI1-565ATD			±1/4	±1/2							
AD7521J	N		±8		0.5 Typ	CMOS-JI	X	I	No	External	
AD7521K			±4								
AD7521L			±2								
AD7531J	N		±8		0.5 Max	CMOS-JI	X	I	No	External	
AD7531K			±4								
AD7531L			±2								
AD7541J	N		±1		1.0 Max	CMOS-JI	X	I	No	External	
AD7541K			±1/2								
AD7541L			±1/2	Monotonic							

DIGITAL TO ANALOG CONVERTERS (Continued)

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	INL LSB	DNL LSB	SETTLING TIME (μs)	TECHNOLOGY	MULTIPLYING	OUTPUT I/V	INPUT BUFFER	REFERENCE	FEATURES
AD7545A	N		±2	±4.0	2.0 Max	CMOS-JI	X	I	Yes	External	
AD7545B			±1	±1.0							
AD7545J			±2	±4.0							
AD7545K			±1	±1.0							

SINGLE POLE SINGLE THROW SWITCH (SPST, FIGURE 1)

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	(NOTE 1) $r_{DS(ON)}$ Ω MAX	SWITCH "ON" (V)	SWITCH "OFF" (V)	TECHNOLOGY	I_{SOFF} (±nA) TYP	T_{ON} (ns) TYP	T_{OFF} (ns) TYP	FEATURES
HI1-5040	-2, -5, -7	HI1-5040/883	75	2.4	7.4	36V CMOS-DI	0.8	370	280	
IH5140	MJE, CJE, CPE	IH5140MJE/883B	100	2.4	0.8	36V CMOS-JI	5.0	175	150	TTL/CMOS Logic

DUAL SINGLE POLE SINGLE THROW SWITCH (2 x SPST, FIGURE 2)

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	(NOTE 1) $r_{DS(ON)}$ Ω MAX	SWITCH "ON" (V)	SWITCH "OFF" (V)	TECHNOLOGY	I_{SOFF} (±nA) TYP	T_{ON} (ns) TYP	T_{OFF} (ns) TYP	FEATURES
DG181	BP, AA, AP, BA	DG181AP/883B	30	2.0	0.8	JFET	1.0	150	130	
DG182	BP, AA, BA, AP	DG182AP/883B	75	2.0	0.8	JFET	1.0	250	130	
DG200	AA, AK BA, BK CJ	DG200AA/883B DG200AK/883B	100	2.4	0.8	36V CMOS-JI	5.0	1000	500	TTL Inputs
DG300A	CA, AA, AK BA, BK CK, CJ	DG300AAA/883B DG300AAK/883B	50	4.0	0.8	44V CMOS-JI	0.1	150	130	TTL/CMOS Inputs
DG401	DJ, DY, EJ, EY	DG401AK/883	45	2.4	0.8	44V CMOS-JI	-0.01	100	60	Very Low $r_{DS(ON)}$

DUAL SINGLE POLE SINGLE THROW SWITCH (2 x SPST, FIGURE 2) (Continued)

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	(NOTE 1) $r_{DS(ON)}$ Ω MAX	SWITCH "ON" (V)	SWITCH "OFF" (V)	TECHNOLOGY	I_{SOFF} (±nA) TYP	T_{ON} (ns) TYP	T_{OFF} (ns) TYP	FEATURES
HI1-0200	-2, -4, -5, -7	HI1-0200/883	80	0.8	2.4	44V CMOS-DI	1.0	240	500 (-5) 330 (-2)	
HI2-0200	-2, -4, -5, -7	HI2-0200/883								
HI3-0200	-5									
HI9P0200	-5, -9									
HI-0222	-5, -9	HI1-0222/883	50	2.0	0.8	36V CMOS-DI	2.5	100	70	Video Switch
HI1-0222	-5, -9									
HI3-0222	-5									
HI4-0222	-5									
HI4P0222	-5									
HI1-0300	-2, -5	HI1-0300/883	50	4.0	0.8	44V CMOS-DI	0.04	210	160	TTL/5V CMOS Logic Very Low Leakage
HI2-0300	-2, -5	HI2-0300/883								
HI3-0300	-5									
HI9P0300	-5, -9									
HI1-0304	-2, -5	HI1-0304/883	50	11.0	3.5	44V CMOS-DI	0.04	160	100	15V CMOS Logic Very Low Leakage
HI2-0304	-2, -5	HI2-0304/883								
HI3-0304	-5									
HI9P0304	-5, -9									
HI1-0381	-2, -5	HI1-0381/883	50	4.0	0.8	44V CMOS-DI	0.04	210	160	Very Low Leakage
HI2-0381	-2, -5	HI2-0381/883								
HI3-0381	-5									
HI9P0381	-5, -9									
HI1-5041	-2, -5, -7, -8	HI1-5041/883	75	2.4	0.8	36V CMOS-DI	0.8	370	280	10Ω $r_{DS(ON)}$ Matching
HI3-5041	-5									
HI1-5048	-2, -5, -7	HI1-5048/883	45	2.4	0.8	36V CMOS-DI	0.8	370	280	5Ω $r_{DS(ON)}$ Matching
HI3-5048	-5									
IH5141	CJE, CPE MJE	IH5141MJE/883B	100	2.4	0.8	36V CMOS-JI	5.0	175	150	TTL/CMOS Logic
IH5341	CPD, ITW, MTW	IH5341MTW/883B	75	2.4	0.8	36V CMOS-JI	1.0	150	80	RF Video T-Switch

QUAD SINGLE POLE SINGLE THROW SWITCH (4 x SPST, FIGURE 3)

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	(NOTE 1) $r_{DS(ON)}$ Ω MAX	SWITCH "ON" (V)	SWITCH "OFF" (V)	TECHNOLOGY	I_{SOFF} (±nA) TYP	T_{ON} (ns) TYP	T_{OFF} (ns) TYP	FEATURES
DG201	AK, BK, CJ	DG201AK/883B	125	2.4	0.8	36V CMOS-JI	±5.0	1000	500	
DG201A	AK, BK, CJ, CK, BY, CY	DG201AAK/883B	115 Typ	0.8	2.4	44V CMOS-JI	0.01	480	370	Very Low Leakage
DG202	AK, BK, CJ, CK	DG202AK/883B	115 Typ	2.4	0.8	44V CMOS-JI	0.01	480	370	Very Low Leakage
DG211	CJ, CY		150 Typ	0.8	2.4	44V CMOS-JI	0.01	460	360	Low Cost
DG212	CJ, CY		150 Typ	2.4	0.8	44V CMOS-JI	0.01	460	360	Low Cost
DG308A	AK, BK CJ, CK, CY	DG308AAK/883B	60 Typ	11.0	3.5	44V CMOS-JI	0.1	130	90	CMOS Logic, Single or Dual Supply Operation
DG309	AK, BK, CJ, CK, CY	DG309AK/883B	60 Typ	3.5	11.0	44V CMOS-JI	0.1	130	90	CMOS Logic, Single or Dual Supply Operation
DG411	DJ, DY, EJ, EY	DG411AK/883	35	0.8	2.4	44V CMOS-JI	-0.1	110	100	Very Low $r_{DS(ON)}$
DG412	DJ, DY EJ, EY	DG412AK/883	35	2.4	0.8	44V CMOS-JI	-0.1	110	100	Very Low $r_{DS(ON)}$
DG413	DJ, DY EJ, EY	DG413AK/883	35	2.4	0.8	44V CMOS-JI	-0.1	110	100	Very Low $r_{DS(ON)}$ Channel 1, 4 "ON" Channel 2, 3 "OFF"
DG441	DJ, DY EJ, EY	DG441AK/883	85	0.8	2.4	44V CMOS-JI	0.01	150	90	Low $r_{DS(ON)}$, Low Leakage
DG442	DJ, DY EJ, EY	DG442AK/883	85	2.4	0.8	44V CMOS-JI	0.01	150	110	Low $r_{DS(ON)}$, Low Leakage
DG444	DJ, DY		85	0.8	2.4	44V CMOS-JI	0.01	150	90	Low $r_{DS(ON)}$, Low Leakage
DG445	DJ, DY		85	2.4	0.8	44V CMOS-JI	0.01	150	110	Low $r_{DS(ON)}$, Low Leakage
HI1-0201	-2, -4, -5, -7, -8	HI1-0201/883	80	2.4	0.8	44V CMOS-DI	2.0	185	220	
HI3-0201	-5									
HI4P0201	-5									
HI9P0201	-5, -9									
		HI4-0201/883								

QUAD SINGLE POLE SINGLE THROW SWITCH (4 x SPST, FIGURE 3) (Continued)

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	(NOTE 1) $r_{DS(ON)}$ Ω MAX	SWITCH "ON" (V)	SWITCH "OFF" (V)	TECHNOLOGY	I_{SOFF} (±nA) TYP	T_{ON} (ns) TYP	T_{OFF} (ns) TYP	FEATURES
HI1-0201HS	-2, -4, -5, -7, -8	HI1-0201HS/883	50	2.4	0.8	36V CMOS-DI	0.3	30	40	High Speed, Low $r_{DS(ON)}$
HI3-0201HS	-4, -5									
HI4P0201HS	-5									
HI9P0201HS	-5, -9									
		HI4-0201HS/883								
IH5052	CDE, MDE		100	2.4	0.8	36V CMOS-JI	5.0	1000	500	Low Power
IH5053	CDE, MDE		100	2.4	0.8	36V CMOS-JI	5.0	1000	500	Low Power
IH5352	CPE, IJE, MJE	IH5352MJE/883B	75	2.4	0.8	36V CMOS-JI	2.0	150	80	RF Video T-Switch
IH5352	CBP, IBP									

FOUR POLE SINGLE THROW SWITCH (4PST, FIGURE 4)

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	(NOTE 1) $r_{DS(ON)}$ Ω MAX	SWITCH "ON" (V)	SWITCH "OFF" (V)	TECHNOLOGY	I_{SOFF} (±nA) TYP	T_{ON} (ns) TYP	T_{OFF} (ns) TYP	FEATURES
HI1-5047	-2, -5, -7	HI1-5047/883	75	2.4	0.8	36V CMOS-JI	0.8	370	280	10Ω Max $r_{DS(ON)}$ Matching
HI3-5047	-5									
HI1-5047A	-2, -5, -7, -8	HI1-5047A/883	45	2.4	0.8	36V CMOS-JI	0.8	370	280	5Ω Max $r_{DS(ON)}$ Matching
HI3-5047A	-5									
HI4P5047A	-5									

SINGLE POLE DOUBLE THROW SWITCH (SPDT, FIGURE 5)

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	(NOTE 1) $r_{DS(ON)}$ Ω MAX	SWITCH "ON" (V)	SWITCH "OFF" (V)	TECHNOLOGY	I_{SOFF} (±nA) TYP	T_{ON} (ns) TYP	T_{OFF} (ns) TYP	FEATURES
DG187	AA, BA, AP	DG187AA/883B	30	2.0	0.8	JFET	2	150	130	
DG188	AA, BA, AP	DG188AA/883B	75	2.0	0.8	JFET	2	250	130	
DG301A	AA, AK BA, BK CA, CJ, CK	DG301AAA/883B DG301AAK/883B	50	4.0	0.8	44V CMOS-JI	0.1	150	130	Channel 1 "ON", Channel 2 "OFF", TTL Inputs
HI1-0301	-2, -5, -7	HI1-0301/883	50	4.0	0.8	44V CMOS-DI	0.04	210	160	Very Low Leakage, TTL Inputs Channel 1 "ON" Channel 2 "OFF"
HI2-0301	-2, -5	HI2-0301/883								
HI3-0301	-5									
HI9P0301	-5, -9									
HI1-0305	-2, -5	HI1-0305/883	50	11.0	3.5	44V CMOS-DI	0.04	160	100	15V CMOS Logic Very Low Leakage Channel 1 "ON" Channel 2 "OFF"
HI2-0305	-2, -5	HI2-0305/883								
HI3-0305	-5									
HI9P0305	-5, -9									
HI1-0387	-2, -5	HI1-0387/883	50	4.0	0.8	44V CMOS-DI	0.04	210	160	Channel 1 "ON", Channel 2 "OFF", Very Low Leakage
HI2-0387	-2, -5	HI2-0387/883								
HI3-0387	-5									
HI9P0387	-5, -9									
HI1-5042	-2, -5, -7	HI1-5042/883	75	2.4	0.8	36V CMOS-DI	0.8	370	280	Channel 1 "ON", Channel 2 "OFF", 10Ω Max $r_{DS(ON)}$ Matching
HI3-5042	-5									
HI1-5050	-2, -5, -7	HI1-5050/883	45	2.4	0.8	36V CMOS-DI	0.8	370	280	Channel 1 "ON", Channel 2 "OFF", 5Ω Max $r_{DS(ON)}$ Matching
HI3-5050	-5									
IH5142	CJE, CPE	IH5142MJE/883B	50	2.4	0.8	36V CMOS-JI	0.5	175	125	

DUAL SINGLE POLE DOUBLE THROW SWITCH (2 x SPDT, FIGURE 6)

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	(NOTE 1) $r_{DS(ON)}$ Ω MAX	SWITCH "ON" (V)	SWITCH "OFF" (V)	TECHNOLOGY	I_{SOFF} (±nA) TYP	T_{ON} (ns) TYP	T_{OFF} (ns) TYP	FEATURES
DG190	AP, BP	DG190AP/883B	30	2.0	0.8	JFET	2	150	130	
DG191	AP, BP	DG191AP/883B	75	2.0	0.8	JFET	2	250	130	
DG303A	CY, AK, BK, CK, CJ, BY	DG303AAK/883B	50	4.0	0.8	44VCMOS-JI	0.1	150	130	TTL and CMOS Compatible
DG403	DJ, DY, EJ, Ey	DG403AK/883	45	2.4	0.8	44V CMOS-JI	-0.01	100	60	
HI1-0303	-2, -5	HI1-0303/883	50	4.0	0.8	44V CMOS-DI	0.04	210	160	Switch 1, 2 "ON", Switch 3, 4 "OFF", Very Low Leakage, TTL Inputs
HI3-0303	-5									
HI9P0303	-5, -9									
HI1-0307	-2, -5, -7	HI1-0307/883	50	11.0	3.5	44V CMOS-DI	0.04	160	100	Switch 1, 2 "ON", Switch 3, 4 "OFF", Very Low Leakage
HI3-0307	-5									
HI9P0307	-5, -9									
HI1-0390	-2, -5	HI1-0390/883	50	4.0	0.8	44V CMOS-DI	0.04	210	160	Switch 1, 2 "ON", Switch 3, 4 "OFF", Very Low Leakage
HI3-0390	-5									
HI9P0390	-5, -9									
HI1-5043	-2, -5 -8	HI1-5043/883	75	2.4	0.8	36V CMOS-DI	0.8	370	280	Switch 1, 2 "ON", Switch 3, 4 "OFF", 10Ω Max $r_{DS(ON)}$ Matching
HI3-5043	-5									
HI9P5043	-5, -9									
HI1-5051	-2, -5, -7, -8	HI1-5051/883	45	2.4	0.8	36V CMOS-DI	0.8	370	280	Switch 1, 2 "ON", Switch 3, 4 "OFF", 5Ω Max $r_{DS(ON)}$ Matching
HI3-5051	-5									
HI4P5051	-5									
HI9P5051	-5, -9									
IH5043	CJE, CPE, CY, MJE	IH5043MJE/883B	130	2.4	0.8	36V CMOS-JI	5.0	1000	500	Switch 1 "ON" Switch 2 "OFF", Low Power
IH5143	CJE, CPE, MJE	IH5143MJE/883B	50	2.4	0.8	36V CMOS-JI	0.5	175	125	
IH5151	CJE, CPE, MJE	MJE/883BH5151	50	2.4	0.8	36V CMOS-JI	1.0	250	200	

DOUBLE POLE SINGLE THROW SWITCH (DPST, FIGURE 7)

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	(NOTE 1) $r_{DS(ON)}$ Ω MAX	SWITCH "ON" (V)	SWITCH "OFF" (V)	TECHNOLOGY	I_{SOFF} (±nA) TYP	T_{ON} (ns) TYP	T_{OFF} (ns) TYP	FEATURES
DG184	AP, BP	DG184AP/883B	30	2.0	0.8	JFET	2	150	130	
DG185	AP, BP	DG185AP/883B	75	2.0	0.8	JFET	2	250	130	
HI1-5044	-2, -5, -7	HI1-5044/883	75	2.4	0.8	36V CMOS-DI	0.8	370	280	10Ω Max $r_{DS(ON)}$ Matching
HI3-5044	-5									
IH5144	CJE, CPE, MJE	IH5144MJE/883B	100	2.4	0.8	36V CMOS-JI	5.0	300	150	TTL/CMOS Logic

DUAL DOUBLE POLE SINGLE THROW SWITCH (2 x DPST, FIGURE 8)

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	(NOTE 1) $r_{DS(ON)}$ Ω MAX	SWITCH "ON" (V)	SWITCH "OFF" (V)	TECHNOLOGY	I_{SOFF} (±nA) TYP	T_{ON} (ns) TYP	T_{OFF} (ns) TYP	FEATURES
DG302A	AK, BK, CK, CJ	DG302AAK/883B	50	4.0	0.8	44V CMOS-JI	0.1	150	130	TTL/CMOS Inputs
DG405	DJ, DY, EJ, EY	DG405AK/883	45	2.4	0.8	44V CMOS-JI	-0.01	100	60	Very Low $r_{DS(ON)}$
HI1-0302	-2, -5	HI1-0302/883	50	4.0	0.8	44V CMOS-DI	0.1	210	160	TTL/5V CMOS Inputs
HI3-0302	-5									
HI9P0302	-5, -9									
HI1-0306	-2, -5	HI1-0306/883	50	11.0	3.5	44V CMOS-DI	0.1	160	100	15V CMOS Logic
HI3-0306	-5									
HI9P0306	-5, -9									
HI1-0384	-2, -5	HI1-0384/883	50	4.0	0.8	44V CMOS-DI	0.04	210	160	Very Low Leakage
HI3-0384	-5									
HI9P0384	-5, -9									
HI1-5045	-2, -5, -7	HI1-5045/883	75	2.4	0.8	36V CMOS-DI	0.8	370	280	10Ω Max $r_{DS(ON)}$ Matching
HI3-5045	-5									
		HI4-5045/883								
HI9P5045	-5, -9									

DUAL DOUBLE POLE SINGLE THROW SWITCH (2 x DPST, FIGURE 8) (Continued)

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	(NOTE 1) $r_{DS(ON)}$ Ω MAX	SWITCH "ON" (V)	SWITCH "OFF" (V)	TECHNOLOGY	I_{SOFF} (±nA) TYP	T_{ON} (ns) TYP	T_{OFF} (ns) TYP	FEATURES
HI1-5049	-2, -5, -7	HI1-5049/883	45	2.4	0.8	36V CMOS-DI	0.8	370	280	5Ω $r_{DS(ON)}$ Matching
HI3-5049	-5									
HI9P5049	-5, -9									
IH5145	CJE, CPE, MJE	IH5145MJE/883B	100	2.4	0.8	36V CMOS-JI	5.0	300	150	TTL/CMOS Logic

DUAL DOUBLE POLE DOUBLE THROW SWITCH (2 x DPDT, FIGURE 9)

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	(NOTE 1) $r_{DS(ON)}$ Ω MAX	SWITCH "ON" (V)	SWITCH "OFF" (V)	TECHNOLOGY	I_{SOFF} (±nA) TYP	T_{ON} (ns) TYP	T_{OFF} (ns) TYP	FEATURES
HI1-5046	-2, -5, -7	HI1-5046/883	75	0.8	2.4	36V CMOS-DI	0.8	370	280	Switch 1 and 4 "ON" Switch 2 and 3 "OFF" 10Ω Max $r_{DS(ON)}$ Matching
HI3-5046	-5									
HI9P5046	-5, -9									
HI1-5046A	-2, -5, -7	HI1-5046A/883	45	0.8	2.4	36V CMOS-DI	0.8	370	280	Switch 1 and 4 "ON" Switch 2 and 3 "OFF" 5Ω Max $r_{DS(ON)}$ Matching
HI3-5046A	-5									

RF/VIDEO "T" SWITCHES ("T" SWITCH, FIGURE 10 and 11)

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	(NOTE 1) $r_{DS(ON)}$ Ω MAX	SWITCH "ON" (V)	SWITCH "OFF" (V)	TECHNOLOGY	I_{SOFF} (±nA) TYP	T_{ON} (ns) TYP	T_{OFF} (ns) TYP	FEATURES
IH5341	ITW, MTW, CPD	IH5341MTW/883B	75	2.4	0.8	36V CMOS-JI	1.0	150	80	Dual SPST
IH5352	MJE	IH5352MJE/883B	75	2.4	0.8	36V CMOS-JI	1.0	150	80	Quad SPST
IH5352	IJE, CPE, CBP, IBP		75	2.4	0.8	36V CMOS-JI	2.0	150	80	Quad SPST

NOTES:

1. The $r_{DS(ON)}$ of a CMOS switch varies as a function of supply voltage, analog signal voltage, and temperature. Values shown are maximum (unless noted "Typ" = typical) at +25°C.
   - SWITCH "ON" V: Digital Threshold to "CLOSE" a particular switch. (Minimum if greater than "OFF". Maximum if less than "OFF".)
   - SWITCH "OFF" V: Digital Threshold to "OPEN" a particular switch. (Minimum if greater than "ON". Maximum if less than "ON".)
   - V_{INL}: Digital Threshold to represent a "Low" select signal. (Maximum, voltage levels greater than this value are not guaranteed to produce a "LOW".)
   - V_{INH}: Digital Threshold to represent a "HIGH" select signal. (Minimum, voltage levels less than this value are not guaranteed to produce a "HIGH".)
2. Package codes:
   - DG Types - SUFFIX:
     - A 10 Lead TO-100
     - J Plastic DIP
     - K CerDIP
     - P SBDIP
     - Y Plastic SOIC
   - IH Types - Middle SUFFIX Letter:
     - J CerDIP
     - P Plastic DIP
     - T TO-100 Can
     - B SOIC
   - HI Types - PREFIX:
     - HI1 CerDIP
     - HI2 Metal Can
     - HI3 Plastic DIP
     - HI4 Ceramic LCC
     - HI4P PLCC
     - HI9P SOIC
3. Temperature Code Suffix:
   - -1: 0° to +200°C
   - -2, A, or M: -55°C to +125°C
   - -4 or B: -25°C to +85°C
   - -5: 0°C to +75°C
   - C: 0°C to +70°C
   - -7: 0°C to +75°C with Burn-In
   - -8: -55°C to +125°C with Burn-In
   - -9: -40°C to +85°C
   - /883: MIL-STD-883, Class B, -55°C to +125°C with Burn-In
   - D: -40°C to +85°C
   - E: -40°C to +85°C with Extended Process Flow
   - I: Industrial, -25°C or -40°C to +85°C, see data sheet

Double Throw switches have one switch ON and the other switch OFF for each input state. See data sheet.

SWITCH CONFIGURATIONS

FIGURE 1. SPST

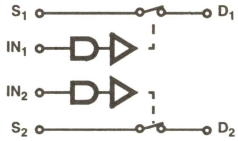


FIGURE 2. DUAL SPST

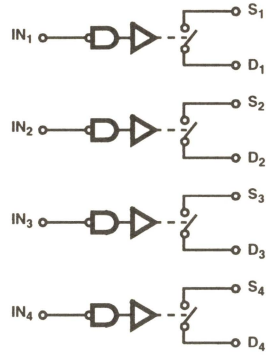


FIGURE 3. QUAD SPST

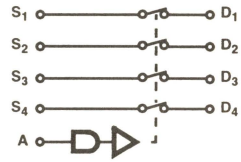


FIGURE 4. 4PST

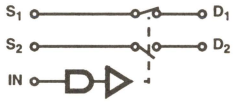


FIGURE 5. SPDT

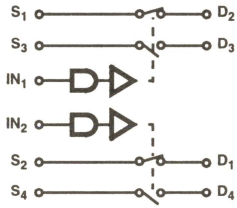


FIGURE 6. DUAL SPDT

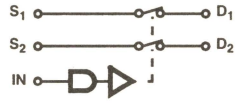


FIGURE 7. DPST

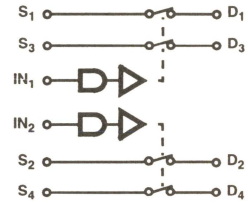


FIGURE 8. DUAL DPST

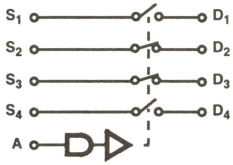


FIGURE 9. DPDT

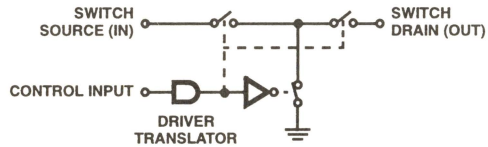


FIGURE 10. "T" SCHECMATIC

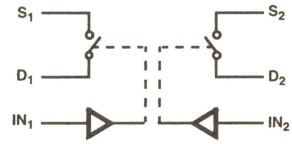


FIGURE 11. "T" SWITCH

SINGLE 1 x 8 MULTIPLEXER (FIGURES 12, 13)

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	(NOTE 1) $r_{DS(ON)}$ (Ω MAX)	V_{INH} MIN (V)	V_{INL} MAX (V)	TECHNOLOGY	I_{DOFF} TYP (±nA)	T_{ON} TYP (ns)	T_{OFF} TYP (ns)	FEATURES
DG408	DJ, DY, EJ, EY	DG408AK/883	40	2.4	0.8	44V CMOS-JI		115	105	Low $r_{DS(ON)}$
DG508A	AK, BK, BY, CJ, CK, CY	DG508AAK/883B	450	2.4	0.8	44V CMOS-DI	0.3	250	250	
DG528	AK, BK, BY, CJ, CK, CY	DG528AK/883B	450	2.4	0.8	44V CMOS-JI	0.015	1,000	400	Microprocessor Compatible
HI1-0508	-2, -4, -5, -7, -8, -9	HI1-0508/883	400	2.4	0.8	44V CMOS-DI	0.3	250	250	
HI3-0508	-5									
HI4P0508	-5									
HI9P0508	-5, -9									
		HI4-0508/883								
HI1-0508A	-2, -5, -7, -8		1800	4.0	0.8	44V CMOS-DI	0.1	300	300	Active Over-Voltage Protection. See Over-Voltage Protected Multiplexers Table, (Note 5)
HI3-0508A	-5									
HI1-0518	-2, -5, -8, -9		750	2.4	0.8	33V CMOS-DI	0.015	120	140	Programmable 1 of 8, Differential 2 of 4, Figure 13, See Over-Voltage Protected Multiplexers Table, (Note 5)
HI3-0518	-5, -9									
HI4-0518	-8									
HI4P0518	-5, -9									
HI9P0518	-5, -9									
HI1-0548	-2, -4, -5	HI1-0548/883	1800	4.0	0.8	44V CMOS-DI	0.1	300	300	Active Over-Voltage Protection. 7% $r_{DS(ON)}$ Matching. See Over-Voltage Protected Multiplexers Table, (Note 5)
HI3-0548	-5, -9									
HI4P0548	-5									
HI9P0548	-5, -9									
		HI4-0548/883								
HI1-1818A	-2, -5, -7	HI1-1818A/883	400	4.0	0.4	40V CMOS-DI	0.1	300	300	
HI3-1818A	-5									
HI4P1818A	-5									

SINGLE 1 x 16 MULTIPLEXER (FIGURE 14)

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	(NOTE 1) $r_{DS(ON)}$ (Ω MAX)	V_{INH} MIN (V)	V_{INL} MAX (V)	TECHNOLOGY	I_{DOFF} TYP (±nA)	T_{ON} TYP (ns)	T_{OFF} TYP (ns)	FEATURES
DG406	DJ, DY, EJ, EY	DG406AK/883	50	2.4	0.8	44V CMOS-JI	0.01	150	70	Low $r_{DS(ON)}$, Low Leakage
DG506A	AK, BK, BY, CJ, CK, CY	DG506AAK/883B	450	2.4	0.8	44V CMOS-DI	0.3	250	250	
DG526	AK, BK, BY, CJ, CK, CY	DG526AK/883B	400	2.4	0.8	44V CMOS-JI	0.2	700	400	Microprocessor Compatible
HI1-0506	-2, -4, -5, -7, -8, -9	HI1-0506/883	400	2.4	0.8	44V CMOS-DI	0.3	250	250	
HI3-0506	-5									
HI4P0506	-5									
HI9P0506	-5, -9									
		HI4-0506/883								
HI1-0506A	-2, -5, -7, -8		1800	4.0	0.8	44V CMOS-DI	0.1	300	300	Active Over-Voltage Protection. See Over-Voltage Protected Multiplexers Table, (Note 5)
HI3-0506A	-5									
HI1-0516	-2, -5, -8	HI1-0516/883	750	2.4	0.8	33V CMOS-DI	0.03	120	140	Programmable, 1 of 16, Differential 2 of 8. See Over-Voltage Protected Multiplexers Table, (Note 5)
HI3-0516	-5									
HI4-0516	-8	HI4-0516/883								
HI4P0516	-5									
HI9P0516	-5, -9									
HI1-0546	-2, -4, -5, -7	HI1-0546/883	1800	4.0	0.8	44V CMOS-DI	0.1	300	300	Active Over-Voltage Protection. See Over-Voltage Protected Multiplexers Table, (Note 5) 7% $r_{DS(ON)}$ Matching
HI3-0546	-5, -9									
HI4P0546	-5									
HI9P0546	-5, -9									
		HI4-0546/883								

DUAL 1 x 4 MULTIPLEXER (FIGURE 15)

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	(NOTE 1) $r_{DS(ON)}$ (Ω MAX)	V_{INH} MIN (V)	V_{INL} MAX (V)	TECHNOLOGY	I_{DOFF} TYP (±nA)	T_{ON} TYP (ns)	T_{OFF} TYP (ns)	FEATURES
DG409	DJ, DY, EJ, EY	DG409AK/883	40	2.4	0.8	44V CMOS-JI		115	105	Low $r_{DS(ON)}$
DG509A	AK, BK, BY, CJ, CK, CY	DG509AAK/883B	400	2.4	0.8	44V CMOS-JI	0.3	250	250	
DG529	AK, BK, BY, CK, CY	DG529K/883B	450	2.4	0.8	44V CMOS-JI	0.008	1000	400	Microprocessor Compatible
HI1-0509	-2, -4, -5, -7, -8, -9	HI1-0509/883	400	2.4	0.8	44V CMOS-DI	0.3	250	250	
HI3-0509	-5									
HI4P0509	-5									
HI9P0509	-5, -9									
		HI4-0509/883								
HI1-0509A	-2, -5, -7, -8		1800	4.0	0.8	44V CMOS-DI	0.1	300	300	Active Over-Voltage Protection, See Over-Voltage Protected Multiplexers Table, (Note 5)
HI3-0509A	-5									
HI1-0518	-2, -5, -8, -9		750	2.4	0.8	33V CMOS-DI	0.015	120	140	Programmable 1 of 8, Differential 2 of 4, (Figure 2), See Programmable Configuration Table
HI3-0518	-5, -9									
HI4-0518	-8									
HI4P0518	-5, -9									
HI9P0518	-5, -9									
HI1-0539	-2, -4, -5, -8		850	4.0	0.8	33V CMOS-DI	0.001	250	160	Low Level Signals, 3% Max $r_{DS(ON)}$ Matching
HI3-0539	-5									
HI4P0539	-5									

DUAL 1 x 4 MULTIPLEXER (FIGURE 15) (Continued)

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	(NOTE 1) $r_{DS(ON)}$ (Ω MAX)	V_{INH} MIN (V)	V_{INL} MAX (V)	TECHNOLOGY	I_{DOFF} TYP (±nA)	T_{ON} TYP (ns)	T_{OFF} TYP (ns)	FEATURES
HI1-0549	-2, -4, -5	HI1-0549/883	1800	4.0	0.8	44V CMOS-DI	0.1	300	300	70V Active Over-Voltage Protection, 7% $r_{DS(ON)}$ Matching, See Over-Voltage Protected Multiplexers Table, (Note 5)
HI3-0549	-5, -9									
HI4P0549	-5									
HI9P0549	-5, -9									
		HI4-0549/883								
HI1-1828A	-2, -5, -7	HI1-1828/883	400	4.0	0.4	40V CMOS-DI	125 Max	300	300	
HI3-1828A	-5									
HI4P1828A	-5, -8									
		HI4-1828A/883								

DUAL 1 x 8 MULTIPLEXER (FIGURE 16)

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	(NOTE 1) $r_{DS(ON)}$ (Ω MAX)	V_{INH} MIN (V)	V_{INL} MAX (V)	TECHNOLOGY	I_{DOFF} TYP (±nA)	T_{ON} TYP (ns)	T_{OFF} TYP (ns)	FEATURES
DG407	DJ, DY, EJ, EY	DG407AK/883	50	2.4	0.8	44V CMOS-JI	0.01	150	70	Low $r_{DS(ON)}$, Low Leakage
DG507A	AK, BK, BY, CJ, CK, CY	DG507AAK/883B	450	2.4	0.8	44V CMOS-JI	0.03	250	250	
DG527	AK, BK, BY, CJ, CK, CY	DG527AK/883B	400	2.4	0.8	44V CMOS-JI	0.2	700	400	Microprocessor Compatible
HI1-0507	-2, -4, -5, -7, -8, -9	HI1-0507/883	400	2.4	0.8	44V CMOS-DI	0.3	250	250	
HI3-0507	-5									
HI4P0507	-5									
HI9P0507	-5, -9									
		HI4-0507/883								

DUAL 1 x 8 MULTIPLEXER (FIGURE 16) (Continued)

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	(NOTE 1) $r_{DS(ON)}$ (Ω MAX)	V_{INH} MIN (V)	V_{INL} MAX (V)	TECHNOLOGY	I_{DOFF} TYP (±nA)	T_{ON} TYP (ns)	T_{OFF} TYP (ns)	FEATURES
HI1-0507A	-2, -5, -7, -8		1800	4.0	0.8	44V CMOS-DI	0.1	300	300	Active Over-Voltage Protection, See Over-Voltage Protected Multiplexers Table, (Note 5)
HI3-0507A	-5									
HI1-0516	-2, -5, -8	HI1-0516/883	750	2.4	0.8	33V CMOS-DI	0.03	120	140	Programmable, 1 of 16, Differential 2 of 8, See Over-Voltage Protected Multiplexers Table
HI3-0516	-5									
HI4-0516	-8	HI4-0516/883								
HI4P0516	-5									
HI9P0516	-5, -9									
HI1-0547	-2, -4, -5, -9	HI1-0547/883	1800	4.0	0.8	44V CMOS-DI	0.1	300	300	Active Over-Voltage Protection, 7% $r_{DS(ON)}$ Matching, See Over-Voltage Protected Multiplexers Table, (Note 5)
HI3-0547	-5, -9									
HI4P0547	-5									
HI9P0547	-5, -9									
		HI4-0547/883								

LATCHABLE MULTIPLEXERS

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	(NOTE 1) $r_{DS(ON)}$ (Ω MAX)	V_{INH} MIN (V)	V_{INL} MAX (V)	TECHNOLOGY	I_{DOFF} TYP (±nA)	T_{ON} TYP (ns)	T_{OFF} TYP (ns)	FEATURES
DG526	AK, BK, CJ, CK	DG526AK/883B	400	2.4	0.8	44V CMOS-JI	0.2	700	400	1 of 16 Channels, Microprocessor Compatible
DG527	AK, BK, CJ, CK	DG527AK/883B	400	2.4	0.8	44V CMOS-JI	0.2	700	400	Differential 1 of 8 Channel, Microprocessor Compatible
DG528	AK, BK, CJ, CK	DG528AK/883B	450	2.4	0.8	44V CMOS-JI	0.015	1,000	400	1 of 8 Channels, Microprocessor Compatible
DG529	AK, BK, CJ, CK	DG529AK/883B	450	2.4	0.8	44V CMOS-JI	0.008	1,000	400	Dual 1 of 4 Channel, Microprocessor Compatible

PROGRAMMABLE CONFIGURATION SINGLE (1 OF 16) OR DIFFERENTIAL (2 OF 8) MULTIPLEXER (FIGURE 17)

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	(NOTE 1) $r_{DS(ON)}$ (Ω MAX)	V_{INH} MIN (V)	V_{INL} MAX (V)	TECHNOLOGY	I_{DOFF} TYP (±nA)	T_{ON} TYP (ns)	T_{OFF} TYP (ns)	FEATURES
HI1-0516	-2, -5, -8	HI1-0516/883	750	2.4	0.8	33V CMOS-DI	0.03	120	140	Programmable, 1 of 16, Differential 2 of 8
HI3-0516	-5									
HI4-0516	-8	HI4-0516/883								
HI4P0516	-5									
HI9P0516	-5, -9									

PROGRAMMABLE CONFIGURATION SINGLE (1 OF 8) OR DIFFERENTIAL (2 OF 4) MULTIPLEXER (FIGURE 18)

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	(NOTE 1) $r_{DS(ON)}$ (Ω MAX)	V_{INH} MIN (V)	V_{INL} MAX (V)	TECHNOLOGY	I_{DOFF} TYP (±nA)	T_{ON} TYP (ns)	T_{OFF} TYP (ns)	FEATURES
HI1-0518	-2, -5, -8, -9		750	2.4	0.8	33V CMOS-DI	0.015	120	140	Programmable, 1 of 8, Differential 2 of 4
HI3-0518	-5, -9									
HI4-0518	-8									
HI4P0518	-5, -9									

OVER-VOLTAGE PROTECTED MULTIPLEXERS (NOTE 6)

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	(NOTE 1) $r_{DS(ON)}$ (Ω MAX)	V_{INH} MIN (V)	V_{INL} MAX (V)	TECHNOLOGY	I_{DOFF} TYP (±nA)	T_{ON} TYP (ns)	T_{OFF} TYP (ns)	NO. OF CHANNELS	FEATURES
HI1-0506A	-2, -5, -7		1800	4.0	0.8	44V CMOS-DI	0.1	300	300	1 x 16	
HI3-0506A	-5										
HI4-0506A	-8										
HI1-0507A	-2, -5, -7		1800	4.0	0.8	44V CMOS-DI	0.1	300	300	2 x 8	Differential Inputs
HI3-0507A	-5										
HI4-0507A	-8										

OVER-VOLTAGE PROTECTED MULTIPLEXERS (NOTE 6) (Continued)

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	(NOTE 1) $r_{DS(ON)}$ (Ω MAX)	V_{INH} MIN (V)	V_{INL} MAX (V)	TECHNOLOGY	I_{DOFF} TYP (±nA)	T_{ON} TYP (ns)	T_{OFF} TYP (ns)	NO. OF CHANNELS	FEATURES
HI1-0508A	-2, -5, -7		1800	4.0	0.8	44V CMOS-DI	0.1	300	300	1 x 8	
HI3-0508A	-5										
HI4-0508A	-8										
HI1-0509A	-2, -5, -7		1800	4.0	0.8	44V CMOS-DI	0.1	300	300	2 x 4	Differential Inputs
HI3-0509A	-5										
HI4-0509A	-8										
HI1-0546	-2, -4, -5	HI1-0546/883	1800	4.0	0.8	44V CMOS-DI	0.1	300	300	1 x 16	7% $r_{DS(ON)}$ Matching
HI3-0546	-5										
HI4P0546	-5										
HI9P0546	-5, -9										
		HI4-0546/883									
HI1-0547		HI1-0547/883	1800	4.0	0.8	44V CMOS-DI	0.1	300	300	2 x 8	7% $r_{DS(ON)}$ Matching Differential Inputs
HI3-0547	-2, -4, -5										
HI4P0547	-5										
HI9P0547	-5, -9										
		HI4-0547/883									
HI1-0548	-2, -4, -5	HI1-0548/883	1800	4.0	0.8	44V CMOS-DI	0.1	300	300	1 x 8	7% $r_{DS(ON)}$ Matching
HI3-0548	-5										
HI4P0548	-5										
HI9P0548	-5, -9										
		HI4-0548/883									
HI1-0549	-2, -4, -5	HI1-0549/883	1800	4.0	0.8	44V CMOS-DI	0.1	300	300	2 x 4	7% $r_{DS(ON)}$ Matching Differential Inputs
HI3-0549	-5										
HI4P0549	-5										
HI9P0549	-5, -9										
		HI4-0549/883									

DIFFERENTIAL INPUT MULTIPLEXERS

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	(NOTE 1) $r_{DS(ON)}$ (Ω MAX)	V_{INH} MIN (V)	V_{INL} MAX (V)	TECHNOLOGY	I_{DOFF} TYP (±nA)	T_{ON} TYP (ns)	T_{OFF} TYP (ns)	NO. OF CHANNELS	FEATURES
DG507A	AK, BK, BY, CJ, CK, CY	DG507AAK/883B	450	2.4	0.8	44V CMOS-JI	0.03	250	250	8	
DG509A	AK, BK, CJ, CK	DG509AAK/883B	400	2.4	0.8	44V CMOS-JI	0.3	250	250	4	
HI1-0507	-2, -4, -5, -7, -8, -9	HI1-0507/883	400	2.4	0.8	44V CMOS-DI	0.1	250	250	2 x 8	
HI3-0507	-5										
HI4P0507	-5										
HI9P0507	-5, -9										
		HI4-0507/883									
HI1-0507A	-2, -5, -7, -8		1800	4.0	0.8	44V CMOS-DI	0.1	300	300	2 x 8	Active Over-Voltage Protection, See Over-Voltage Protected Multiplexers Table, (Note 5)
HI3-0507A	-5										
HI4-0507A	-8										
HI1-0509	-2, -4, -5, -7, -8, -9	HI1-0509/883	450	2.4	0.8	44V CMOS-DI	0.3	250	250	2 x 4	
HI3-0509	-5										
HI4P0509	-5										
HI9P0509	-5, -9										
		HI4-0509/883									
HI1-0509A	-2, -5, -7, -8		1800	4.0	0.8	44V CMOS-DI	0.1	300	300	2 x 4	Active Over-Voltage Protection, See Over-Voltage Protected Multiplexers Table, (Note 5)
HI3-0509A	-5										
HI4-0509A	-8										
HI1-0516	-2, -5, -8	HI1-0516/883	1800	4.0	0.8	33V CMOS-DI	0.1	500	500	1 x 16	7% $r_{DS(ON)}$ Matching
HI3-0516	-5										
HI4-0516	-8	HI4-0516/883									
HI4P0516	-5										
HI9P0516	-5, -9										

DIFFERENTIAL INPUT MULTIPLEXERS (Continued)

(NOTES 2, 3) DEVICE	SUFFIX CODES	MIL SPEC	(NOTE 1) $r_{DS(ON)}$ (Ω MAX)	V_{INH} MIN (V)	V_{INL} MAX (V)	TECHNOLOGY	I_{DOFF} TYP (±nA)	T_{ON} TYP (ns)	T_{OFF} TYP (ns)	NO. OF CHANNELS	FEATURES
HI1-0518	-2, -5, -8, -9		750	2.4	0.8	33V CMOS-DI	0.015	120	140	4	Programmable 1 of 8, Differential 2 of 4, Figure 13, See Programmable Configuration Table
HI3-0518	-5, -9										
HI4-0518	-8										
HI4P0518	-5, -9										
HI9P0518	-5, -9										
HI1-0539	-2, -4, -5, -8		850	4.0	0.8	33V CMOS-DI	0.001	250	160	4	Low Level Signals, 3% Max $r_{DS(ON)}$ Matching
HI3-0539	-5										
HI4P0539	-5										
HI1-0547	-2, -4, -5, -9	HI1-0547/883	1800	4.0	0.8	44V CMOS-DI	0.1	300	300	2 x 8	Active Over-Voltage Protection, 7% $r_{DS(ON)}$ Matching See Over-Voltage Protected Multiplexers Table, (Note 5)
HI3-0547	-5, -9										
HI4P0547	-5										
HI9P0547	-5, -9										
		HI4-0547/883									
HI1-0549	-2, -4, -5	HI1-0549/883	1800	4.0	0.8	44V CMOS-DI	0.1	300	300	2 x 4	70V Active Over-Voltage Protection, 7% $r_{DS(ON)}$ Matching, See Over-Voltage Protected Multiplexers Table, (Note 5)
HI3-0549	-5, -9										
HI4P0549	-5										
HI9P0549	-5, -9										
		HI4-0549/883									
HI1-1828A	-2, -5, -7	HI1-1828A/883	400	4.0	0.4	40V CMOS-DI	125 Max	300	300	2 x 4	
HI3-1828A	-5										
HI4-1828A	-8	HI4-1828A/883									
HI4P1828A	-5										

NOTES:

1. The $r_{DS(ON)}$ of a CMOS switch varies as a function of supply voltage, analog signal voltage, and temperature. Values shown are maximum (unless noted "Typ" = typical) at +25°C.
   SWITCH "ON" V: Digital Threshold to "CLOSE" a particular switch. (Minimum if greater than "OFF". Maximum if less than "OFF".)
   SWITCH "OFF" V: Digital Threshold to "OPEN" a particular switch. (Minimum if greater than "ON". Maximum if less than "ON".)
   V_{INL}: Digital Threshold to represent a "Low" select signal. (Maximum, voltage levels greater than this value are not guaranteed to produce a "LOW".)
   V_{INH}: Digital Threshold to represent a "HIGH" select signal. (Minimum, voltage levels less than this value are not guaranteed to produce a "HIGH".)
2. Package codes:
   DG Types - SUFFIX:
   A 10 Lead TO-100 J Plastic DIP K CerDIP P SBDIP Y SOIC
   IH Types - Middle SUFFIX Letter:
   J CerDIP P Plastic DIP T TO-100 Can B SOIC HI4P PLCC
   HI Types - PREFIX:
   HI1 Ceramic DIP HI2 Metal Can HI3 Plastic DIP HI4 Ceramic LCC HI9 Flatpack HI9P SOIC
3. Temperature Code Suffix:
   -1: 0° to +200°C
   -2, A, or M: -55°C to +125°C
   -4 or B: -25°C to +85°C
   -5: 0°C to +75°C
   C: 0°C to +70°C
   -7: 0°C to +75°C with Burn-In
   -8: -55°C to +125°C with Burn-In
   -9: -40°C to +85°C
   /883: MIL-STD-883, Class B, -55°C to +125°C with Burn-In
   D: -40°C to +85°C
   E: -40°C to +85°C with Extended Process Flow
   I: Industrial, -25°C or -40°C to +85°C, see data sheet.
4. Double Throw switches have one switch ON and the other switch OFF for each input state. See data sheet.
5. Over-Voltage Protection: Analog Inputs can withstand up to 70V peak to peak levels, with no channel interaction.
6. Fault Protection: All channels are OFF when supply power is off, up to +25V inputs. Any channel turns OFF when input exceeds supply rail.

MULTIPLEXER CONFIGURATIONS

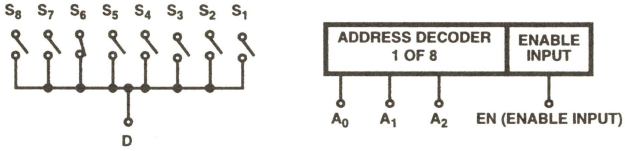


FIGURE 12. 1 x 8 MULTIPLEXER

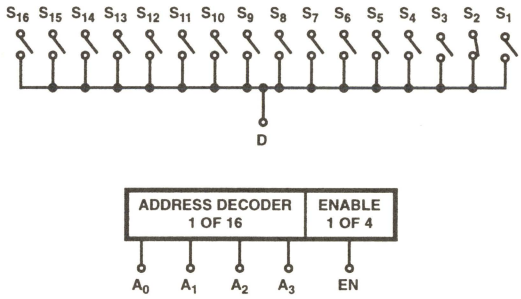


FIGURE 14. 1 x 16 MULTIPLEXER

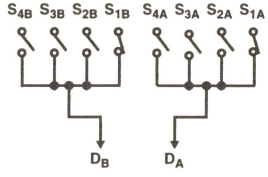
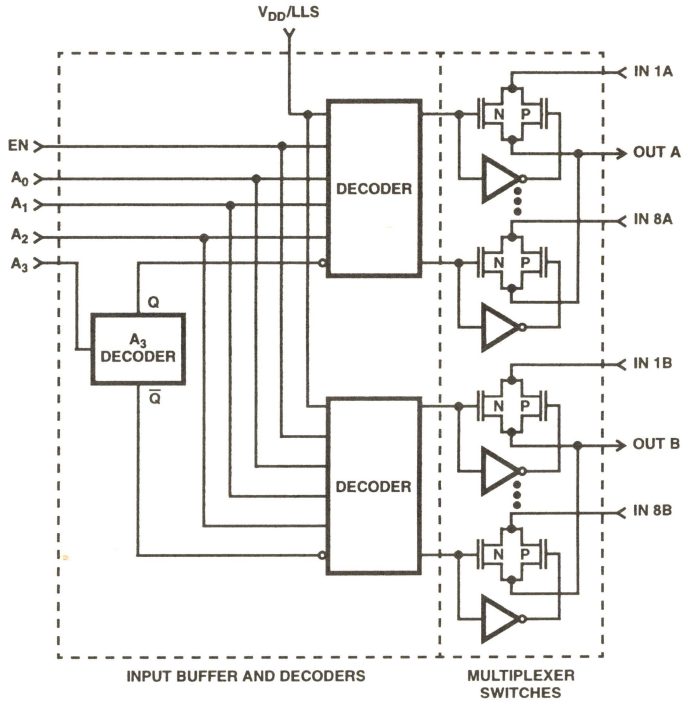


FIGURE 15. DUAL 1 x 4 MUX



A3 DECODER		
A3	Q	$\overline{Q}$
H	H	L
L	L	H
V-	L	L

FIGURE 13. PROGRAMMABLE

MULTIPLEXER CONFIGURATIONS (Continued)

FIGURE 16. DUAL 1 x 8 MUX

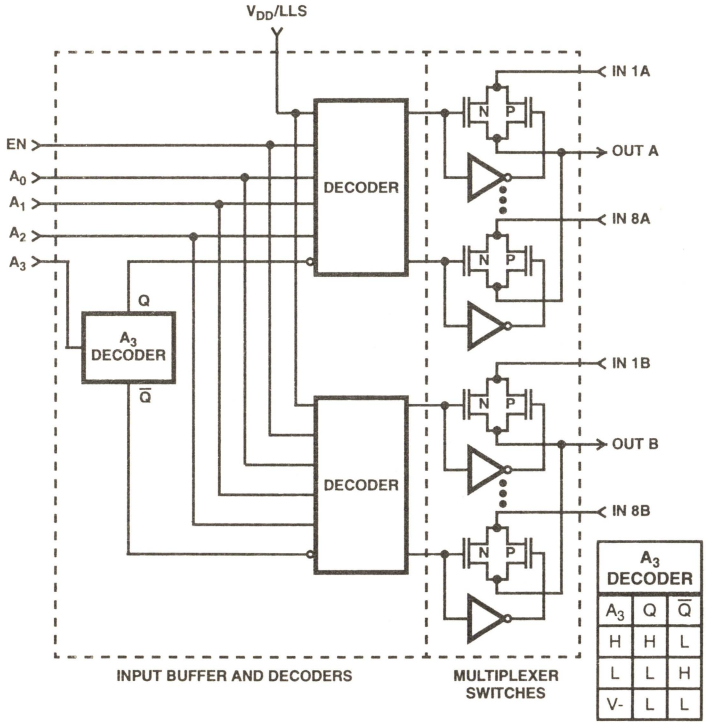


FIGURE 17. PROGRAMMABLE SINGLE 16 OR DIFFERENTIAL 8

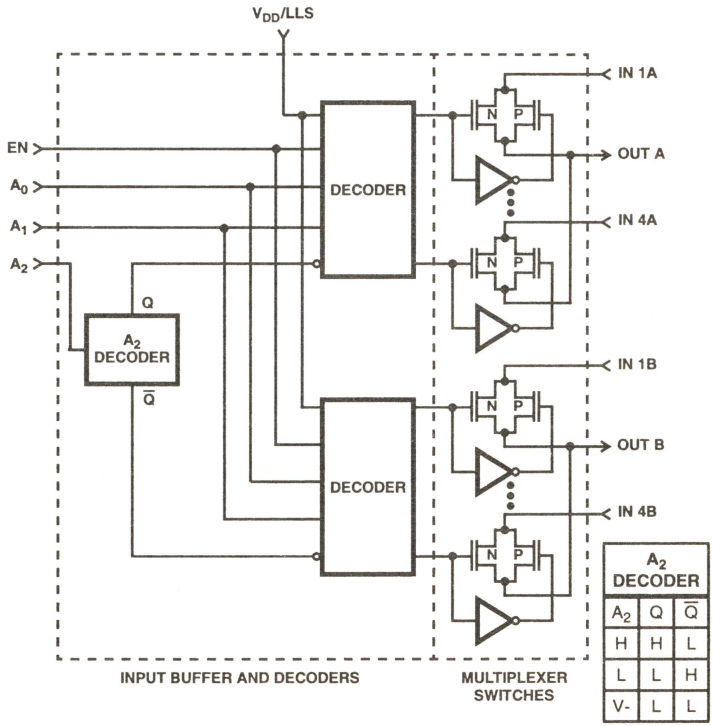


FIGURE 18. PROGRAMMABLE SINGLE 8 OR DIFFERENTIAL 4

REAL-TIME CLOCKS

TYPE	COMMENTS AND APPLICATIONS	NUMBER OF PINS	µP INTERFACE					OSCILLATOR				TIME KEEPING FUNCTIONS							ALARM FUNCTIONS			POWER DOWN MODES			
			STANDARD µP INTERFACE	MUX BUS OPTION	PROGRAMMABLE SQUARE WAVE OUTPUT SIGNAL	INTERRUPTS	BYTES OF GENERAL PURPOSE RAM	ON BOARD OSCILLATOR	60Hz LINE	4.197MHz, 1.049MHz, 32.768kHz XTAL	2.097MHz XTAL	READS SEC., MIN., HR., DAY, MONTH	READS YEAR, DATE	DAYLIGHT SAVINGS TIME	AUTOMATIC END OF MONTH RECOGNITION	AUTOMATIC LEAP YEAR COMPENSATION	12 OR 24 HOUR CLOCK WITH AM/PM	BCD FORMAT AVAILABLE	1/10s, 1/100s ALARM	SEC., MIN., HR. ALARM	DAY, MONTH, YEAR, DATE ALARM	POWER SENSE INPUT/DETECTION	BATTERY INPUT PIN	STANDBY TIME KEEPING	POWER DOWN MODE (µA)
1800 SERIES																									
CDP1879	Real-Time Clock, 4V to 10.5V Operation	24	•		•	•		•		•	•	•					•	•			•				50
6805 SERIES																									
CDP6818 CDP6818A	Real-Time Clock, RAM, Motel Bus for Connection to any µP	24	•	•	•	•	50	•		•		•	•	•	•	•	•	•		•		•			50
CDP68HC68T1	Real-Time Clock with RAM and Power Sense/Control, 3-Wire SPI Bus Peripheral	16			•	•	32	•	•	•	•	•	•							•		•	•	•	12
GENERAL																									
ICM7170	Real-Time Clock-Time Keeping and Date Stamping for Personal Computers, Communica-tions, Robotics, Auto, etc.	24	•	•		•		•		•	•	•	•		•	•	•		•	•	•	•	•	•	5

TIMER/COUNTERS

TYPE	COMMENTS AND APPLICATIONS	µP I/F		COUNTER MODES						COUNTERS								
		STANDARD 8-BIT µP INTERFACE (RD, WR)	INTERRUPT ON TERMINAL COUNT	TIMEOUT OUTPUT CHANGES WHEN COUNTER DECREMENTS TO "0"	TIMEOUT STROBE ONE CLOCK-WIDE OUTPUT PULSE WHEN COUNTER DECREMENTS TO "0"	GATE CONTROLLED ONE-SHOT OUTPUT CHANGES WHEN COUNTER DECREMENTS TO "0". RETRIGGERABLE	SOFTWARE-CONTROLLED ONE-SHOT OUTPUT CHANGES WHEN COUNTER DECREMENTS TO "0". RETRIGGERABLE	RATE GENERATOR REPETITIVE CLOCK-WIDE OUTPUT PULSE	VARIABLE DUTY CYCLE REPETITIVE OUTPUT WITH PROGRAMMED FREQUENCY AND DUTY CYCLE	COUNTER FREQUENCY (MHz)	NUMBER OF CLOCK INPUTS	GATE ENABLED COUNTING	NUMBER OF GATES	NUMBER OF OUTPUTS	BINARY COUNTING	BCD COUNTING	NUMBER OF 16-BIT DOWN COUNTERS	NUMBER OF 8-BIT DOWN COUNTERS
1800 SERIES																		
CDP1878	Dual Timer/ Counter Power Supply, Motor Control, Square Wave Generators, One-Shot 4V to 10.5V Operation CDP1800 Series Peripheral	•	•	•	•	•		•	•	1	2	•	2	2	•		2	
80C86/88 SERIES																		
82C54	Programmable Interval Timer/ Counter for Generation of Accurate Time Delays Under Software Control in 80C86/88 System, Real-Time Clock, Motor Control, Watchdog Timer, Square Wave Gen.	•	•	•	•	•	•	•	• (Note 1)	10	3	•	3	3	•	•	3	
6805 SERIES																		
CDP68HC68W1	Digital Pulse Width Modulator, Modulates a Clock Input to Supply a Variable Freq. and Duty-Cycle Output Signal. 8-Lead DIP 6805 SPI Bus Serial I/F Motor Control								•	8	1			1	•			2

NOTE:

1. Reloading of count register will allow variable duty cycle. Otherwise this mode generates a square wave output.

TIMER/COUNTERS WITH DISPLAY DRIVERS

TYPE	COMMENTS AND APPLICATIONS	DISPLAY					FUNCTIONS															
		LED			LCD	VF	UNIT COUNT				UNIVERSAL COUNTERS											
		COMMON ANODE, NON-MUX	COMMON CATHODE, MUX	COMMON ANODE, MUX	DIRECT DRIVE, NON-MUX	NON-MUX	UP/DOWN	UP ONLY	DECADE	MODULE 60 (HR/MIN/SEC)	FREQUENCY	PERIOD	FREQUENCY RATIO	TIME INTERVAL	MUX BCD OUTPUTS	DISPLAY LATCH	DISPLAY BLANKING	COUNT ENABLE	LEADING ZERO BLANKING	PRESET COUNT	COMPARISON REGISTER	EQUAL AND ZERO OUTPUT	MAX COUNT SPEED (MHz)
4 DIGIT																							
ICM7217	Industrial Control: Preset Predetermining Counters, Sequencers, On Off Delay Timers, Batch Counters. Presets and Loads Compare Register From Thumbwheel Switches			•			•		•		(Note 1)				•	•	•		•	•	•	•	2
ICM7217A			•				•		•		(Note 1)				•	•	•		•	•	•	•	2
ICM7217B				•			•			•					•	•	•		•	•	•	•	2
ICM7217C			•				•			•					•	•	•		•	•	•	•	2
4.5 DIGIT																							
ICM7224	10μA Operating Current, Can Be Cascaded for More Digits				•			•	•		(Note 1)					•		•	•				15
ICM7225	Has Brightness Adjustment. 10μA Current with Display Blanked, Cascadable	•						•	•		(Note 1)					•	•	•	•				15
5.5 DIGIT																							
ICM7249	Event Timer Counter, Hour Meter. 14 Programmable Modes. Selectable Input Filtering				•			•	•					•					•				
7 DIGIT																							
ICM7208	Use with ICM7202A for a 7 Digit Frequency Counter		•					•	•		(Note 1)					•	•	•	•				2.5
8 DIGIT																							
ICM7216A	Universal Frequency Counter with Display Drivers. 4 Internal Gate Times, Auto Decimal Point, Leading Zero Blanking, Overflow Indication. Display Off, Hold, and Reset Inputs.			•				•	•		•	•	•	•		•	•		•				10
ICM7216B			•					•	•		•	•	•	•		•	•		•				10
ICM7216C				•				•	•		•					•	•		•				10
ICM7216D			•					•	•		•					•	•		•				10
ICM7226A	Same as ICM7216 Plus Period and Time Interval Averaging. BCD Outputs, μP PIA Compatible			•				•	•		•	•	•	•	•	•	•	•	•				10
ICM7226B			•					•	•		•	•	•	•	•	•	•	•	•				10

NOTE:

1. These counters will measure frequency when used with the ICM7207 (0.01s or 0.1s timebase) or the ICM7207A (0.1s and 1s timebase).

DISPLAY DRIVERS

TYPE	COMMENTS AND APPLICATIONS	NUMBER OF CHARACTERS OR DIGITS						DISPLAY TYPE						FONT			INTERFACE				
		NUMBER OF 7-SEGMENT DIGITS	NUMBER OF DECIMAL POINTS OR ANNUNCIATORS	NUMBER OF ALPHANUMERIC 14 SEGMENTS + DP	NUMBER OF ALPHANUMERIC 16 SEGMENTS + DP	NUMBER OF ALPHANUMERIC 18 SEGMENTS	NUMBER OF DOT MATRIX	LED, COMMON ANODE NON-MUX	LED, COMMON CATHODE MUX	LED, COMMON ANODE MUX	LCD, DIRECT DRIVE	LCD, NUMBER OF WAYS MUX'D	VACUUM FLUORESCENT	HEXADECIMAL (0-9, A-F)	CODE B (0-9, H, E, L, P, -, AND BLANK)	ASCII	MUX BCD (BCD + DIGIT SELECT STROBES)	RANDOM ACCESS (DATA + ADDRESS + WR)	BIT PARALLEL, DIGIT SERIAL	BIT SERIAL	CYCLE TIME (ns)
ICM7211	Drives Conventional LCD Displays. Includes RC Oscillator, Divider Chain, Latches, Interface and LCD Drivers	4									•			•			•				1000
ICM7211A		4									•				•		•				1000
ICM7211M		4									•			•				•			200
ICM7211AM		4									•				•			•			200
ICM7212	Drives Common Anode LED Displays. 28 Current Controlled Outputs. Includes Latches, Interface and Brightness Control.	4						•						•			•				1000
ICM7212A		4						•							•		•				1000
ICM7212M		4						•						•				•			200
ICM7212AM		4						•							•			•			200
ICM7218A	3 Decode Formats Drives Up to 64 Independent LEDs. Includes 8 x 8 Memory, Multiplexed LED Drivers, Encoders, Interface and Control. Applications Include Bar Graphs.	8	8							•				•	•				•		550
ICM7218B		8	8						•					•	•			•			550
ICM7218C		8	8							•				•	•				•		500
ICM7218D		8	8						•					•	•			•			500
ICM7218E		8	8							•				•	•			•			500
ICM7228A		8	8							•				•	•				•		550
ICM7228B		8	8						•					•	•			•			550
ICM7228C		8	8							•				•	•				•		500
ICM7228D		8	8						•					•	•			•			500
ICM7231A	8 Digits, 16 Annunciators on COM, Hexadecimal	8	16									3		•				•			500
ICM7231B	8 Digits, 16 Annunciators on COM 3, Code B	8	16									3			•			•			500
ICM7231C	8 Digits, 16 Annunciators on COM 1 +3, Code B	8	16									3			•			•			500
ICM7232A	10 Digits, 20 Annunciators on COM 3, Code B	10	20									3		•						•	350
ICM7232B	10 Digits, 20 Annunciators on COM 3, Code B	10	20									3			•					•	350
ICM7232C	10 Digits, 20 Annunciators on COM 1 +3, Code B	10	20									3			•					•	350
ICM7243A	8 Alphanumeric Characters + Decimal pt. Can Be Daisy Chained or Cascaded				8				•							•		•	•		250
ICM7243B				8					•							•		•	•		250
CA3161	BCD-to Seven Segment Decoder Driver	1						•							•		•				2600
CA3168	2 Digit BCD-to Seven Segment Decoder Driver	2						•						•			•				2600

TIMERS/OSCILLATORS

PART NUMBER	DESCRIPTION	MAX OUTPUT FREQ. (ASTABLE)	TEMP RANGE	POWER SUPPLY REQUIREMENT	PACKAGE TYPES
CA555 (Note 1)	Industry Standard Bipolar Timer Replaces: SE555, NE555, MC1555, MC1455	10kHz (Typ)	COM, IND, MIL	+4.5V to +18V at 15mA	8 Lead CAN 8 Pin DIL SOIC 8 Lead Plastic DIP
ICM7555 (Note 1)	Low Power CMOS Equivalent of Industry Standard 555 Timer-Only 80µA Supply Current. Does Not Have the Large Supply Current Transients of the Bipolar 555 and Does Not Require the Large Bypassing Capacitors Needed By the 555. Low Leakage Threshold and Trigger Inputs Allow Use of Higher Impedance RC Timing Components for Extra Long Time Delay.	1MHz (Typ)	COM, IND, MIL	+2V to +18V at 300µA	8 Lead CAN 8 Lead SOIC 8 Lead Plastic DIP
ICM7556	A Dual ICM7555, CMOS, Low Power Equivalent of the Bipolar 556 Timer.	1MHz (Typ)	COM, IND, MIL	+2V to +18V at 600µA	14 Lead Plastic DIP 14 Lead CerDIP
ICM7242 (Note 1)	Long-Range Fixed Timer. RC Oscillator +8-Bit Counter. Fixed 256 Count. Used for Extremely Long Time Delays. Cascadable. Can Be Used for Delay Times in Excess of Several Days.	2MHz (Typ)	COM, IND	+2V to +16V at 800µA	8 Lead Plastic DIP 8 Lead SOIC
HA7210	32.768kHz Micropower Clock Oscillator, Very Low Power Crystal-Controlled Oscillator, Externally Programmed to Operate - 10kHz to 10MHz, Very high Stability, Over Voltage and Temperature Range.	10MHz	IND	+2V to +7V at 5µA	8 Lead PDIP 8 Lead SOIC Die

NOTE:
1. SOIC

SPECIAL PURPOSE CIRCUITS

ICL8038
PRECISION WAVEFORM GENERATOR/VCO

Features

- Provides High Accuracy Sine, Square, Triangular, Sawtooth And Pulse Waveforms
- Wide Operating Frequency Range . . . . .0.001Hz - 300kHz
- Low Frequency Drift. . . . . 250ppm/°C
- Low Distortion (1% - Sinewave, 0.1% Tri-Wave)
- Simultaneous Outputs
- 14 Lead CerDIP and 14 Lead Plastic DIP

Applications

- Ring Generation (Telecom)
- Frequency Synthesis

ICL8069
LOW VOLTAGE REFERENCE (1.2V)

Features

- Bandgap Type Achieves Low Noise, Excellent Stability
- Low Bias Current (50µA Min) - Good For Battery Powered Applications
- Low Cost
- 2 Terminal TO-52 Package
- 50ppm/°C Temperature

Applications

- A/D and D/A Reference Voltages
- Threshold Detectors
- Voltage Regulators

AD590
2-WIRE, CURRENT OUTPUT TEMPERATURE TRANSDUCER

Features

- Current Output for Noise Immunity
- Wide Supply Range . . . . . +4V to +30V
- Easy to Use
- Wide Temperature Range . . . . . -55°C to +125°C
- 2 Terminal TO-52 Package

Applications

- General Purpose Temperature Sensing
- Remote Temperature Sensing

Data Acquisition Package Selection Guide

Using the Selection Guide:

The first character of each entry indicates the package type, while the number preceding the decimal point details the package lead count. Except for MQFP, LCC, SIP, and Can packages, the decimal point and succeeding numbers specify the reference package width in inches (e.g. __.150 = 150 mil width). For Package Outlines refer to Section 10.

PART NUMBER	PDIP	SOIC/ SSOP	PLCC	MQFP	CERDIP	SIDE-BRAZE	LCC	SIP	CAN
AD590									T3.A
AD7520	E16.3				F16.3				
AD7521	E18.3								
AD7523	E16.3								
AD7530	E16.3								
AD7531	E18.3								
AD7533	E16.3								
AD7541	E18.3								
AD7545	E20.3								
ADC0802	E20.3				F20.3				
ADC0803	E20.3	M20.3			F20.3				
ADC0804	E20.3				F20.3				
CA3161	E16.3								
CA3162	E16.3								
CA3162A	E16.3								
CA3168	E20.3								
CA3168E	E20.3								
CA3304	E16.3	M16.3			F16.3				
CA3306	E18.3	M20.3			F18.3		J20.B		
CA3310	E24.3	M24.3			F24.3				
CA3310A	E24.3	M24.3			F24.3				
CA3318C	E24.6	M24.3			F24.6				
CA3338	E16.3	M16.3			F16.3				
CA3338A	E16.3	M16.3			F16.3				
CA555	E8.3	M8.15							T8.C
DG200	E14.3				F14.3				T10.B
DG201	E16.3				F16.3				
DG201A	E16.3	M16.3			F16.3				
DG202	E16.3				F16.3				
DG211	E16.3	M16.15							
DG212	E16.3	M16.15							
DG300A	E14.3				F14.3				T10.B
DG301A	E14.3				F14.3				T10.B
DG302A	E14.3				F14.3				
DG303A	E14.3	M16.3			F14.3				
DG308A	E16.3	M16.15			F16.3				

EXAMPLE: M 16 .15

PACKAGE TYPE — LEAD COUNT — BODY WIDTH

Package outlines and dimensions are available in Section 10.

Data Acquisition Package Selection Guide

PART NUMBER	PDIP	SOIC/ SSOP	PLCC	MQFP	CERDIP	SIDE-BRAZE	LCC	SIP	CAN
DG309	E16.3	M16.15			F16.3				
DG401	E16.3	M16.15			F16.3				
DG403	E16.3	M16.15			F16.3				
DG405	E16.3	M16.15			F16.3				
DG406	E16.3	M16.15							
DG407	E16.3	M16.15							
DG408	E16.3	M16.15			F16.3				
DG409	E16.3	M16.15			F16.3				
DG411	E16.3	M16.15			F16.3				
DG412	E16.3	M16.15			F16.3				
DG413	E16.3	M16.15			F16.3				
DG441	E16.3	M16.15			F16.3				
DG442	E16.3	M16.15			F16.3				
DG444	E16.3	M16.15							
DG445	E16.3	M16.15							
DG506A	E28.6	M28.3			F28.6				
DG507A	E28.6	M28.3			F28.6				
DG508A	E16.3	M16.3			F16.3				
DG509A	E16.3	M16.3			F16.3				
DG526	E28.6	M28.3			F28.6				
DG527	E28.6	M28.3			F28.6				
DG528	E18.3	M18.3			F18.3				
DG529	E18.3	M18.3			F18.3				
HA7210	E8.3	M8.15							
HI-0200	E14.3				F14.3				T10.B
HI-0201	E16.3	M16.15	N20.35		F16.3				
HI-0201-HS	E16.3	M16.3	N20.35		F16.3		J20.A		
HI-0300	E14.3	M14.15			F14.3				T10.B
HI-0301	E14.3	M14.15			F14.3				T10.B
HI-0302	E14.3	M14.15			F14.3				
HI-0303	E14.3	M14.15			F14.3				
HI-0304	E14.3	M14.15			F14.3				T10.B
HI-0305	E14.3	M14.15			F14.3				T10.B
HI-0306	E14.3	M14.15			F14.3				
HI-0307	E14.3	M14.15			F14.3				
HI-0381	E14.3	M14.15			F14.3				T10.B
HI-0384	E16.3	M16.3			F16.3				
HI-0387	E14.3	M14.15			F14.3				T10.B
HI-0390	E16.3	M16.3			F16.3				
HI-0506	E28.6	M28.3	N28.45		F28.6		J28.A		

EXAMPLE: M 16 .15

PACKAGE TYPE — LEAD COUNT — BODY WIDTH

Package outlines and dimensions are available in Section 10.

Data Acquisition Package Selection Guide

PART NUMBER	PDIP	SOIC/ SSOP	PLCC	MQFP	CERDIP	SIDE-BRAZE	LCC	SIP	CAN
HI-0506A	E28.6				F28.6				
HI-0507	E28.6	M28.3	N28.45		F28.6		J28.A		
HI-0507A	E28.6				F28.6				
HI-0508	E16.3	M16.15	N20.35		F16.3		J20.A		
HI-0508A	E16.3				F16.3				
HI-0509	E16.3	M16.15	N20.35		F16.3		J20.A		
HI-0509A	E16.3				F16.3				
HI-0516	E28.6	M28.3	N28.45		F28.6		J28.A		
HI-0518	E18.3	M18.3	N20.35		F18.3		J20.A		
HI-0524	E18.3		N20.35		F18.3		J20.A		
HI-0539	E16.3		N20.35		F16.3				
HI-0546	E28.6	M28.3	N28.45		F28.6		J28.A		
HI-0547	E28.6	M28.3	N28.45		F28.6		J28.A		
HI-0548	E16.3	M16.15	N20.35		F16.3		J20.A		
HI-0549	E16.3	M16.15	N20.35		F16.3		J20.A		
HI-0565A						D24.6			
HI-0574A	E28.6					D28.6	J44.A		
HI-0674A	E28.6					D28.6	J44.A		
HI-0774	E28.6					D28.6	J44.A		
HI1166							J68.A		
HI1171		M24.2-S							
HI1175	E24.4-S	M24.2-S							
HI1176				Q32.7x7-S					
HI1179				Q32.7x7-S					
HI1276							J68.B		
HI1386	E28.6A-S						J44.B		
HI1396	E42.6A-S					D42.6	J68.A		
HI3050				Q64.14x20-S					
HI5721	E28.6	M28.3							
HI-1818A	E16.3		N20.35		F16.3				
HI-1828A	E16.3		N20.35		F16.3		J20.A		
HI-5040	E16.3				F16.3				
HI-5041	E16.3				F16.3				
HI-5042	E16.3				F16.3				
HI-5043	E16.3	M16.15			F16.3		J20.A		
HI-5044	E16.3				F16.3				
HI-5045	E16.3	M16.15			F16.3				
HI-5046	E16.3				F16.3				
HI-5046A	E16.3				F16.3				
HI-5047	E16.3				F16.3				
HI-5047A	E16.3				F16.3				

EXAMPLE: **M 16 .15**

PACKAGE TYPE — LEAD COUNT — BODY WIDTH

Package outlines and dimensions are available in Section 10.

Data Acquisition Package Selection Guide

PART NUMBER	PDIP	SOIC/ SSOP	PLCC	MQFP	CERDIP	SIDE-BRAZE	LCC	SIP	CAN
HI-5048	E16.3				F16.3				
HI-5049	E16.3	M16.15			F16.3				
HI-5050	E16.3				F16.3				
HI-5051	E16.3	M16.15	N20.35		F16.3		J20.A		
HI-5700	E28.6	M28.3							
HI-5701	E18.3	M18.3							
HI5702		M28.3							
HI5703		M28.3							
HI5710				Q48.7x7-S					
HI5800						D40.6			
HI5810	E24.3	M24.3			F24.3				
HI5812	E24.3	M24.3			F24.3				
HI5813	E24.3	M24.3			F24.3				
HI7131	E40.6			Q44.10x10					
HI7133	E40.6			Q44.10x10					
HI7159A	E28.6								
HI7190	E20.3	M20.3			F20.3				
HI20201	E28.6A-S	M28.3A-S							
HI20203	E28.6A-S	M28.3A-S							
HI-DAC80V	E24.6								
HI-DAC85V	E24.6								
HIN230		M20.3							
HIN231		M16.3							
HIN232	E16.3	M16.3			F16.3				
HIN234		M16.3							
HIN236	E24.3	M24.3							
HIN237	E24.3	M24.3							
HIN238	E24.3	M24.3							
HIN239		M24.3							
HIN240				Q44.10x10					
HIN241		M28.3/ M28.209							
ICL232	E16.3	M16.3			F16.3				
ICL7106	E40.6			Q44.10x10					
ICL7107	E40.6			Q44.10x10					
ICL7109	E40.6				F40.6	D40.6			
ICL7116	E40.6			Q44.10x10					
ICL7117	E40.6								
ICL7126	E40.6								
ICL71C03	E28.6								
ICL7129	E40.6			Q44.10x10					

EXAMPLE: M 16 .15

PACKAGE TYPE — LEAD COUNT — BODY WIDTH

Package outlines and dimensions are available in Section 10.

Data Acquisition Package Selection Guide

PART NUMBER	PDIP	SOIC/ SSOP	PLCC	MQFP	CERDIP	SIDE-BRAZE	LCC	SIP	CAN
ICL7135	E28.6								
ICL7136	E40.6			Q44.10x10					
ICL7137	E40.6			Q44.10x10					
ICL7139	E40.6								
ICL7149	E40.6			Q44.10x10					
ICL8052	E14.3				F14.3	D14.3			
ICL8068					F14.3	D14.3			
ICL8069		M8.15						Z3.05A	T2.A
ICM7170	E24.6	M24.3			F24.6				
ICM7211	E40.6			Q44.10x10					
ICM7212	E40.6								
ICM7213	E14.3								
ICM7216A	E28.6				F28.6				
ICM7216B	E28.6				F28.6				
ICM7216D	E28.6				F28.6				
ICM7217	E28.6				F28.6				
ICM7218									
ICM7224	E40.6								
ICM7226A	E40.6								
ICM7226B					F40.6				
ICM7228	E28.6	M28.3			F28.6				
ICM7231	E40.6				F40.6				
ICM7232	E40.6				F40.6				
ICM7242	E8.3	M8.15							
ICM7243	E40.6				F40.6				
ICM7249	E48.6								
ICM7555	E8.3	M8.15							T8.C
ICM7556	E14.3				F14.3				
IH5043	E16.3	M16.3			F16.3				
IH5052					F16.3				
IH5053					F16.3				
IH5140	E16.3				F16.3				
IH5141	E16.3				F16.3				
IH5142	E16.3				F16.3				
IH5143	E16.3				F16.3				
IH5144	E16.3				F16.3				
IH5145	E16.3				F16.3				
IH5151	E16.3				F16.3				
IH5341	E14.3								T10.B
IH5352	E16.3	M20.3			F16.3				T10.B

EXAMPLE: **M 16 .15**

Package outlines and dimensions are available in Section 10.

DSP 4

PRODUCT SELECTION GUIDE

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New Digital Signal Processing Products

HSP43124
SERIAL I/O FILTER

AnswerFAX DOCUMENT # 3555

- 24-Bit Input, 32-Bit Output Data
- 256 Tap Programmable FIR Filter
- 5 Cascaded Half Band Filters

HSP50016
DIGITAL DOWN CONVERTER

AnswerFAX DOCUMENT # 3288

- Single Chip Narrow Band Down Converter
- Input Sample Rate . . . . . .52 MSPS
- Output Sample Rate . . . . . 82Hz to 459Hz
- Tuning Resolution 0.0012Hz

HSP43216
HALF BAND FILTER

AnswerFAX DOCUMENT # 3365

- Up/Down Conversion by Fs/4
- Interpolation/Decimation by 2
- Shape Factor 1.24
- Passband Ripple . . . . . <0.0005dB
- Stopband Attenuation . . . . . .>90dB

HSP50016-EV
DDC EVALUATION BOARD

AnswerFAX DOCUMENT # 3637

- PC Based Data and Control
- Real Time Data and Control
- Rapid Prototyping

HSP48212
DIGITAL VIDEO MIXER

AnswerFAX DOCUMENT # 3627

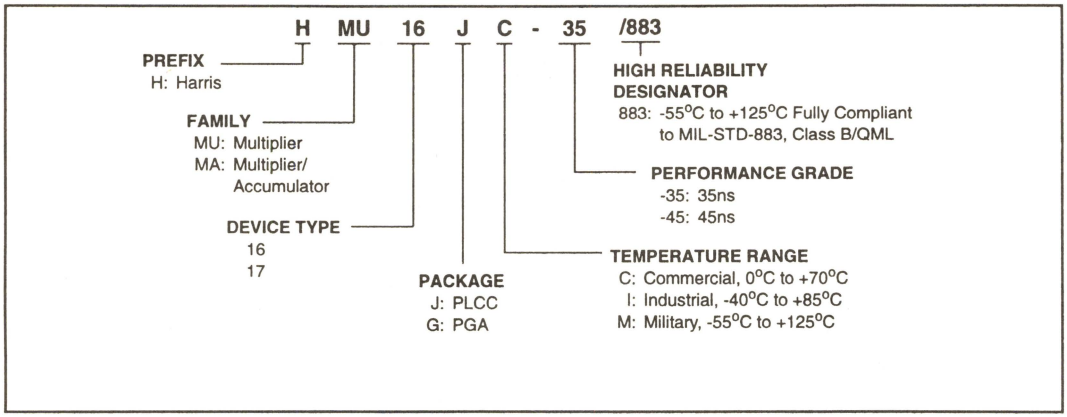
- Mixed Two 12-Bit Video Data Streams
- 12-Bit Mix Factor
- Programmable Pipeline Delays
- Input Sample Rate . . . . . 40 MSPS

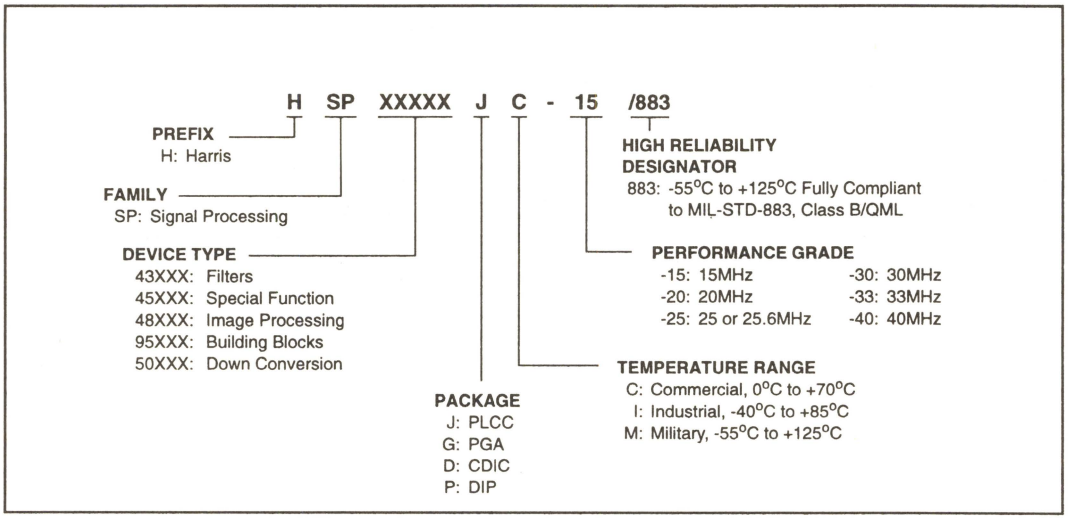
HSP50110
DIGITAL QUADRATURE TUNER

AnswerFAX DOCUMENT # 3651

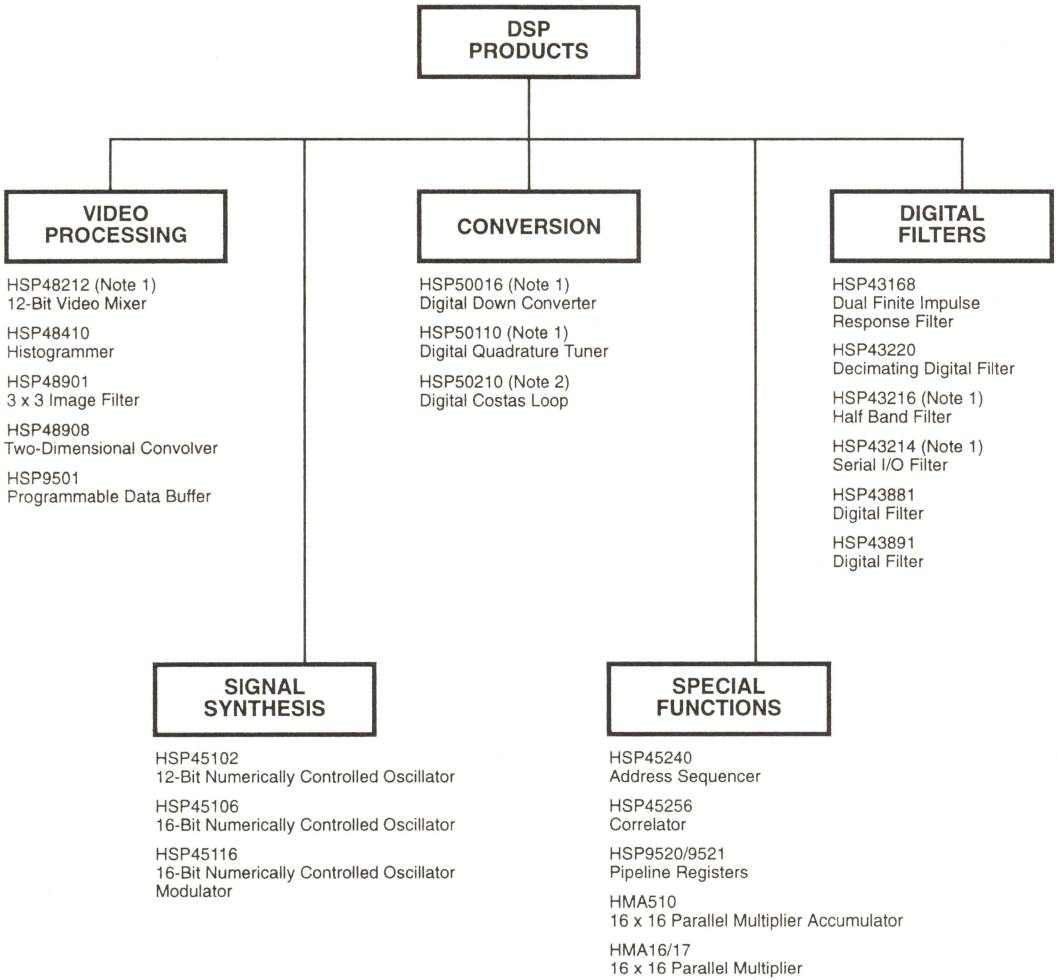
- Front End Of Demodulation Chip Set
- Demodulates PSK, FSK, AM, FM
- Provides Tuning, Initial Filtering
- Input Sample Rate . . . . . .52 MSPS
- Data Bits 10

Digital Signal Processing Ordering Information





Digital Signal Processing Product Selection Tree



NOTE:

1. New Product
2. Future Product

DEVELOPMENT TOOLS

DECI•MATE™
HARRIS HSP43220 DECIMATING DIGITAL FILTER DEVELOPMENT SOFTWARE

Description

Harris DECI•MATE Development Software assists the design engineer to prototype designs for the Harris HSP43220 Decimating Digital filter (DDF). Developed specifically for the DDF, this software consists of three integrated modules: DDF Design, DDF Simulator and DDF PROM. The Design module designs a filter from a set of user specifications for the DDF. The Simulator module models the DDFs internal operation. The PROM module uses the device configuration created by the Design module to build a PROM data file that can be used to store and download the DDF configuration.

HSP45116-DB
HSP45116 DAUGHTER BOARD

Features

- Designed for Use with HSP-EVAL
- Access to HSP45116 Input, Output, and Control Signals Through Three 50-Pin Headers
- HSP45116 Control Signal States May be Set Through Hardware Configuration or Software
- Two Separate Software Packages for Daughter Board I/O and Control
- High Speed I/O Supported

Applications

- PC Based Performance Analysis of HSP45116 when Used with HSP-EVAL
- Rapid Prototyping

Description

The HSP45116-DB is a daughter board designed to mate with the HSP-EVAL for rapid evaluation and prototyping of the HSP45116 Numerically Controlled Oscillator Modulator. Together, the board set provides a mechanism to evaluate HSP45116 operation using IBM PC™ based I/O and control. The HSP45116-DB maps the input, output, and control signals of the HSP45116 to three 50 pin headers. These headers mate with connectors on board the HSP-EVAL to interface the HSP45116's various I/O and control signals with the HSP-EVALs data busses. This interface establishes a path for PC™ based I/O and control of the HSP45116-DB via the HSP-EVAL.

HSP50016-EV
DDC EVALUATION PLATFORM

Features

- Single HSP50016-EV may be Used to Evaluate the HSP50016
- May be Daisy Chained to Support Evaluation of Multi-Chip Solutions
- Parallel Port Interface to Support IBM PC™ Based Evaluation and Control
- Three Clocking Modes for Flexibility in Performance Analysis and Prototyping
- Dual 96-Pin Input/Output Connectors Conforming to the VME J2/P2 Connector Standard

Applications

- PC Based Performance Analysis of HSP50016
- Rapid Prototyping

Description

The HSP50016-EV is the evaluation board for the HSP50016 Digital Down Converter (DDC). It provides a mechanism for rapid evaluation and prototyping. The HSP50016-EV consists of a series of busses which provide input, output, and control to the DDC. These busses are brought out through dual 96-Pin connectors to support daisy chaining HSP50016-EVs with other Harris evaluation boards for multichip prototyping and evaluation.

SERINADE™
HSP43124 SERIAL I/O FILTER DEVELOPMENT SOFTWARE

Description

SERINADE was developed by Harris specifically to design filter configurations for the HSP43124 Serial I/O Filter. Design specifications are supplied by the user in terms of frequencies and gains. SERINADE automatically computes the optimum configuration of the Serial I/O Filter's cascadable halfband filters and programmable finite impulse response (FIR) filter; it also allows the user to manually design his or her own configuration.

DEVELOPMENT TOOLS (Continued)

HSP-EVAL
DSP EVALUATION PLATFORM

Features

- Single HSP-EVAL May be Used to Evaluate a Variety of Parts Within the HSPXXXXX Family of DSP Products
- May be Daisy Chained to Support Evaluation of Multi-Chip Solutions
- Parallel Port Interface to Support IBM PC™ Based Evaluation and Control
- Three Clocking Modes for Flexibility in Performance Analysis and Prototyping
- Dual 96-Pin Input/Output Connectors Conforming to the VME J2/P2 Connector Standard

Applications

- PC Based Performance Analysis of HSPXXXXX Family of DSP Products
- Rapid Prototyping

Description

The HSP-EVAL is the mother board for a set of daughter boards based on the HSPXXXXX family of Digital Signal Processing products. Each product specific daughter board is mated with the HSP-EVAL to provide a mechanism for rapid evaluation and prototyping. The HSP-EVAL consists of a series of busses which provide input, output, and control to the target daughter board. These buses are brought out through dual 96-Pin connectors to support daisy chaining HSP-EVALs for multichip prototyping and evaluation.

DOWN CONVERSION AND DEMODULATION

HSP50016
DIGITAL DOWN CONVERTER

Features

- 52 MSPS Input Data Rate
- 16-Bit Data Input
- Spurious Free Dynamic Range Through Modulator >102dB
- Frequency Selectivity: <0.006Hz
- Identical Lowpass Filters for I and Q
- Passband Ripple: <0.04dB
- Stopband Attenuation: >104dB
- Filter -3dB to -102dB Shape Factor: <1.5
- Decimation from 64 to 131,072
- IEEE 1149.1 Test Access Port

Applications

- Digital Radio Receivers
- Channelized Receivers
- Spectrum Analysis

Description

The Digital Down Converter (DDC) is a single chip synthesizer, quadrature mixer and lowpass filter. Its input data is a sampled data stream of up to 16 bits in width and up to a 52 MSPS data rate. The DDC performs down conversion, narrowband low pass filtering and decimation to produce a baseband signal.

Ordering Information

PART NUMBER	TEMPERATURE RANGE	PACKAGE
HSP50016JC-52	0°C to +70°C	44 Lead PLCC
HSP50016JC-75	0°C to +70°C	44 Lead PLCC
HSP50016GC-52	0°C to +70°C	48 Lead PGA

HSP50110
DIGITAL QUADRATURE TUNER

Features

- 10-Bit Real or Complex Inputs
- Frequency Selectivity <0.014Hz
- Data Rates to 52 MSPS
- Third Order Cascaded-Integrator-Comb (CIC) Filter Configurable as Integrate and Dump Filter (First Order CIC) or Bypassable
- Decimation from 1-4096, or Set by Resampling NCO Used for Bit Synchronization
- Error Detection for External IF AGC Loop
- Internal AGC Loop for Output Level Stability
- Bi-Directional 8-Bit Microprocessor Interface
- Parallel or Serial Output Data Formats

Applications

- Phase and Frequency Modulation
- VSAT, INMARSAT Systems

Description

The Digital Quadrature Tuner (DQT) provides many of the functions needed for digital demodulation. These functions include carrier L.O. generation, symbol clock generation, preselection filtering, baseband AGC, and IF AGC error detection. The DQT facilitates many different digital implementations of demodulator tracking loops, which allows this chip to handle multiple modes and/or data rates simply by loading a new set of control words.

Ordering Information

PART NUMBER	TEMPERATURE RANGE	PACKAGE
HSP50110JC-52	0°C to +70°C	84 Lead PLCC

MULTIPLIERS

HMA510
16 x 16-BIT CMOS PARALLEL MULTIPLIER ACCUMULATOR

Features

- 16 x 16-Bit Parallel Multiplication with Accumulation to a 35-Bit Result
- High-Speed (45ns Commercial, 55ns Military) Multiply Accumulate Time
- Low Power CMOS Operation
  - I_{CCSB} = 500µA Maximum
  - I_{CCOP} = 7.0mA Maximum at 1.0MHz
- HMA510 is Compatible with the CY7C510 and the IDT7210
- Supports Two's Complement or Unsigned Magnitude Operations
- TTL Compatible Inputs/Outputs
- Three-State Outputs
- Also Available as /883

Description

The HMA510 is a high speed, low power CMOS 16 x 16-bit parallel multiplier accumulator capable of operating at 45ns clocked multiply-accumulate cycles. The 16-bit X and Y operands may be specified as either two's complement or unsigned magnitude format. Additional inputs are provided for the accumulator functions which include: loading the accumulator with the current product, adding or subtracting the accumulator contents and the current product, and pre-loading the accumulator registers from the external inputs.

Ordering Information

PART NUMBER	TEMPERATURE RANGE	PACKAGE
HMA510JC-45	0°C to +70°C	68 Lead PLCC
HMA510JC-55	0°C to +70°C	68 Lead PLCC
HMA510GC-55	0°C to +70°C	68 Lead PGA
HMA510GM-55/883	-55°C to +125°C	68 Lead PGA
HMA510GM-65/883	-55°C to +125°C	68 Lead PGA
HMA510GM-75/883	-55°C to +125°C	68 Lead PGA

HMU16, HMU17
16 x 16-BIT CMOS PARALLEL MULTIPLIERS

Features

- 16 x 16-Bit Parallel Multiplier with Full 32-Bit Product
- Low Power Operation
  - I_{CCSB} = 500µA Maximum
  - I_{CCOP} = 7.0mA Maximum at 1MHz
- Supports Two's Complement, Unsigned Magnitude and Mixed Mode Multiplication
- HMU16 is Compatible with the AM29516, LMU16, IDT7216 and the CY7C516
- HMU17 is Compatible with the AM29517, LMU17, IDT7217 and the CY7C517
- Also Available as /883

Applications

- Fast Fourier Transform Analysis
- Digital Filtering
- Graphic Display Systems
- Image Processing
- Radar and Sonar

Description

The HMU16 and HMU17 are high speed, low power CMOS 16 x 16-bit multipliers ideal for fast, real time digital signal processing applications.

Ordering Information

PART NUMBER	TEMPERATURE RANGE	PACKAGE
HMU16JC-35	0°C to +70°C	68 Lead PLCC
HMU16JC-45	0°C to +70°C	68 Lead PLCC
HMU16GC-35	0°C to +70°C	68 Lead PGA
HMU16GC-45	0°C to +70°C	68 Lead PGA
HMU16GM-45/883	-55°C to +125°C	68 Lead PGA
HMU16GM-60/883	-55°C to +125°C	68 Lead PGA
HMU17JC-35	0°C to +70°C	68 Lead PLCC
HMU17JC-45	0°C to +70°C	68 Lead PLCC
HMU17GC-35	0°C to +70°C	68 Lead PGA
HMU17GC-45	0°C to +70°C	68 Lead PGA
HMU17GM-45/883	-55°C to +125°C	68 Lead PGA
HMU17GM-60/883	-55°C to +125°C	68 Lead PGA

ONE DIMENSIONAL FILTERS

HSP43168
DUAL FIR FILTER

Features

- Two Independent 8-Tap FIR Filters Configurable as a Single 16-Tap FIR
- 10-Bit Data and Coefficients
- On-Board Storage for 32 Programmable Coefficient Sets
- Up To: 256 FIR Taps, 16 x 16 2-D Kernels, or 10 x 19-Bit Data and Coefficients
- Programmable Decimation to 16
- Programmable Rounding on Output
- Standard Microprocessor Interface
- Also Available as /883

Applications

- Quadrature, Complex Filtering
- Image Processing
- PolyPhase Filtering
- Adaptive Filtering

Description

The HSP43168 Dual FIR Filter consists of two independent 8-tap FIR filters. Each filter supports decimation from 1 to 16 and provides on-board storage for 32 sets of coefficients. The design includes two FIR cells each fed by a separate coefficient bank and one of two separate inputs. The outputs of the FIR cells are either summed or multiplexed by the MUX/Adder. The compute power in the FIR Cells can be configured to provide quadrature filtering, complex filtering, 2-D convolution, 1-D/2-D correlations, and interpolating/decimating filters.

Ordering Information

PART NUMBER	TEMPERATURE RANGE	PACKAGE
HSP43168VC-33	0°C to +70°C	100 Lead MQFP
HSP43168VC-45	0°C to +70°C	100 Lead MQFP
HSP43168JC-33	0°C to +70°C	84 Lead PLCC
HSP43168JC-45	0°C to +70°C	84 Lead PLCC
HSP43168JI-40	-40°C to +85°C	84 Lead PLCC
HSP43168GC-33	0°C to +70°C	84 Lead PGA
HSP43168GC-45	0°C to +70°C	84 Lead PGA
HSP43168GM-25/883	-55°C to +125°C	84 Lead PGA
HSP43168GM-33/883	-55°C to +125°C	84 Lead PGA

HSP43220
DECIMATING DIGITAL FILTER

Features

- Narrow Band Filter with up to 96dB Attenuation
- DC to 33MHz Clock Rate
- 16-Bit 2's Complement Input
- 20-Bit Coefficients in FIR
- 24-Bit Extended Precision Output
- Programmable Decimation up to a Maximum of 16,384
- Standard 16-Bit Microprocessor Interface
- Filter Design Software Available DECI•MATE™
- Also Available as /883

Applications

- Very Narrow Band Filters
- Zoom Spectral Analysis
- Channelized Receivers
- Large Sample Rate Converter

Description

The HSP43220 Decimating Digital Filter is a linear phase low pass decimation filter which is optimized for filtering narrow band signals in a broad spectrum of a signal processing applications. The HSP43220 offers a single chip solution to signal processing application which have historically required several boards of IC's. This reduction in component count results in faster development times as well as reduction of hardware costs.

Ordering Information

PART NUMBER	TEMPERATURE RANGE	PACKAGE
HSP43220VC-15	0°C to +70°C	100 Lead MQFP
HSP43220VC-25	0°C to +70°C	100 Lead MQFP
HSP43220VC-33	0°C to +70°C	100 Lead MQFP
HSP43220JC-15	0°C to +70°C	84 Lead PLCC
HSP43220JC-25	0°C to +70°C	84 Lead PLCC
HSP43220JC-33	0°C to +70°C	84 Lead PLCC
HSP43220GC-15	0°C to +70°C	84 Lead PGA
HSP43220GC-25	0°C to +70°C	84 Lead PGA
HSP43220GC-33	0°C to +70°C	84 Lead PGA
HSP43220TM-15	-55°C to +125°C	84 Lead TAB
HSP43220TM-25	-55°C to +125°C	84 Lead TAB
HSP43220GM-15/883	-55°C to +125°C	84 Lead PGA
HSP43220GM-25/883	-55°C to +125°C	84 Lead PGA

ONE DIMENSIONAL FILTERS (Continued)

HSP43881, HSP43891
DIGITAL FILTER

Features

- Eight Filter Cells
- 0MHz to 30MHz Sample Rate
- 8-Bit or 9-Bit Coefficients and Signal Data
- 26-Bit Accumulator Per Stage
- Filter Lengths Over 1000 Taps
- Expandable Coefficient Size, Data Size and Filter Length
- Decimation by 2, 3 or 4
- Also Available as /883

Applications

- 1-D and 2-D FIR Filters
- Radar/Sonar
- Adaptive Filters
- Echo Cancellation
- Complex Multiply-Add
- Sample Rate Converters

Description

The HSP43881 and HSP43891 are video speed Digital Filters (DF) designed to efficiently implement vector operations such as FIR digital filters. It is comprised of eight filter cells cascaded internally and a shift and add output stage, all in a single integrated circuit. Each filter cell contains a 8 x 8-bit multiplier (9 x 9-bit multiplier for the HSP43891), three decimation registers and a 26-bit accumulator. The HSP43881 and HSP43891 have maximum sample rate of 30MHz. The effective multiply accumulate (mac) rate is 240MHz.

Ordering Information

PART NUMBER	TEMPERATURE RANGE	PACKAGE
HSP43881JC-20	0°C to +70°C	84 Lead PLCC
HSP43881JC-25	0°C to +70°C	84 Lead PLCC
HSP43881JC-30	0°C to +70°C	84 Lead PLCC
HSP43881GC-20	0°C to +70°C	85 Lead PGA
HSP43881GC-25	0°C to +70°C	85 Lead PGA
HSP43881GC-30	0°C to +70°C	85 Lead PGA
HSP43881GM-20/883	-55°C to +125°C	85 Lead PGA
HSP43881GM-25/883	-55°C to +125°C	85 Lead PGA
HSP43891VC-20	0°C to +70°C	100 Lead MQFP
HSP43891VC-25	0°C to +70°C	100 Lead MQFP
HSP43891VC-30	0°C to +70°C	100 Lead MQFP
HSP43891JC-20	0°C to +70°C	84 Lead PLCC
HSP43891JC-25	0°C to +70°C	84 Lead PLCC
HSP43891JC-30	0°C to +70°C	84 Lead PLCC
HSP43891GC-20	0°C to +70°C	85 Lead PGA
HSP43891GC-25	0°C to +70°C	85 Lead PGA
HSP43891GC-30	0°C to +70°C	85 Lead PGA
HSP43891GM-20/883	-55°C to +125°C	85 Lead PGA
HSP43891GM-25/883	-55°C to +125°C	85 Lead PGA

SIGNAL SYNTHESIZERS

HSP45102
12-BIT NUMERICALLY CONTROLLED OSCILLATOR

Features

- 33MHz, 40MHz Versions
- 32-Bit Frequency Control
- BFSK, QPSK Modulation
- Serial Frequency Load
- 12-Bit Sine Output
- Offset Binary Output Format
- 0.009Hz Tuning Resolution at 40MHz
- Spurious Frequency Components < -69dBc
- Fully Static CMOS
- Low Cost

Applications

- Direct Digital Synthesis
- Modulation

Description

The Harris HSP45102 is Numerically Controlled Oscillator with 32-bit frequency resolution and 12-bit output. With over 69dB of spurious free dynamic range and worst case frequency resolution of 0.009Hz, the NCO12 provides dramatic improvements in accuracy over other frequency synthesis solutions at a competitive price.

Ordering Information

PART NUMBER	TEMPERATURE RANGE	PACKAGE
HSP45102PC-33	0°C to +70°C	28 Lead Plastic DIP
HSP45102PC-40	0°C to +70°C	28 Lead Plastic DIP
HSP45102PI-33	-40°C to +85°C	28 Lead Plastic DIP
HSP45102PI-40	-40°C to +85°C	28 Lead Plastic DIP
HSP45102SC-33	0°C to +70°C	28 Lead SOIC
HSP45102SC-40	0°C to +70°C	28 Lead SOIC
HSP45102SI-33	-40°C to +85°C	28 Lead SOIC
HSP45102SI-40	-40°C to +85°C	28 Lead SOIC

HSP45106
16-BIT NUMERICALLY CONTROLLED OSCILLATOR

Features

- 25.6MHz, 33MHz Versions
- 32-Bit Center and Offset Frequency Control
- 16-Bit Phase Control
- 8 Level PSK Supported Through Three Pin Interface
- Simultaneous 16-Bit Sine and Cosine Outputs
- Output in Two's Complement or Offset Binary
- <0.008Hz Tuning Resolution at 33MHz
- Serial or Parallel Outputs
- Spurious Frequency Components < -90dBc
- 16-Bit Microprocessor Compatible Control Interface
- Also Available as /883

Applications

- Direct Digital Synthesis
- Quadrature Signal Generation
- Modulation - FM, FSK, PSK (BPSK, QPSK, 8PSK)
- Precision Signal Generation

Description

The Harris HSP45106 is a high performance 16-bit quadrature numerically controlled oscillator (NCO16). The NCO16 simplifies applications requiring frequency and phase agility such as frequency-hopped modems, PSK modems, spread spectrum communications, and precision signal generators. As shown in the block diagram, the HSP45106 is divided into a Phase/Frequency Control Section (PFCS) and a Sine/Cosine Section.

Ordering Information

PART NUMBER	TEMPERATURE RANGE	PACKAGE
HSP45106JC-25	0°C to +70°C	84 Lead PLCC
HSP45106JC-33	0°C to +70°C	84 Lead PLCC
HSP45106GC-25	0°C to +70°C	85 Lead PGA
HSP45106GC-33	0°C to +70°C	85 Lead PGA
HSP45106GM-25/883	-55°C to +125°C	85 Lead PGA

SIGNAL SYNTHESIZERS (Continued)

HSP45116
NUMERICALLY CONTROLLED
OSCILLATOR/MODULATOR

Features

- NCO and CMAC on One Chip
- 15MHz, 25.6MHz, 33MHz, and 52MHz Versions
- 32-Bit Frequency Control
- 16-Bit Phase Modulation
- 16-Bit CMAC
- 0.008Hz Tuning Resolution at 33MHz
- Spurious Frequency Components < -90dBc
- Also Available as /883

Applications

- Frequency Synthesis
- Modulation - AM, FM, PSK, FSK, QAM
- Demodulation, PLL
- Phase Shifter

Description

The Harris HSP45116 combines a high performance quadrature numerically controlled oscillator (NCO) and a high speed 16-bit Complex Multiplier/Accumulator (CMAC) on a single IC. This combination of functions allows a complex vector to be multiplied by the internally generated (cos, sin) vector for quadrature modulation and demodulation. As shown in the block diagram, the HSP45116 is divided into three main sections. The Phase/Frequency Control Section (PFCS) and the Sine/Cosine Section together form a complex NCO. The CMAC multiplies the output of the Sine/Cosine Section with an external complex vector.

Ordering Information

PART NUMBER	TEMPERATURE RANGE	PACKAGE
HSP45116VC-15	0°C to +70°C	160 Lead MQFP
HSP45116VC-25	0°C to +70°C	160 Lead MQFP
HSP45116GC-15	0°C to +70°C	145 Lead PGA
HSP45116GC-25	0°C to +70°C	145 Lead PGA
HSP45116GC-33	0°C to +70°C	145 Lead PGA
HSP45116TM-15	-55°C to +125°C	156 Lead TAB
HSP45116TM-25	-55°C to +125°C	156 Lead TAB
HSP45116AVC-52	0°C to +70°C	160 Lead MQFP
HSP45116GM-15/883	-55°C to +125°C	145 Lead PGA
HSP45116GM-25/883	-55°C to +125°C	145 Lead PGA

SPECIAL FUNCTION

HSP45240
ADDRESS SEQUENCER

Features

- Block Oriented 24-Bit Sequencer
- Configurable as Two Independent 12-Bit Sequencers
- 24 x 24 Crosspoint Switch
- Programmable Delay on 12 Outputs
- Multi-Chip Synchronization Signals
- Standard µP Interface
- 100pF Drive on Outputs
- DC to 50MHz Clock Rate
- Also Available as /883

Applications

- 1-D, 2-D Filtering
- Pan/Zoom Addressing
- FFT Processing
- Matrix Math Operations

Description

The Harris HSP45240 is a high speed Address Sequencer which provides specialized addressing for functions like FFTs,1-D and 2-D filtering, matrix operations, and image manipulation. The sequencer supports block oriented addressing of large data sets up to 24-bits at clock speeds up to 50MHz.

Ordering Information

PART NUMBER	TEMPERATURE RANGE	PACKAGE
HSP45240JC-33	0°C to +70°C	68 Lead PLCC
HSP45240JC-40	0°C to +70°C	68 Lead PLCC
HSP45240JC-50	0°C to +70°C	68 Lead PLCC
HSP45240GC-33	0°C to +70°C	68 Lead PGA
HSP45240GC-40	0°C to +70°C	68 Lead PGA
HSP45240GC-50	0°C to +70°C	68 Lead PGA
HSP45240GM-25/883	-55°C to +125°C	68 Lead PGA
HSP45240GM-33/883	-55°C to +125°C	68 Lead PGA
HSP45240GM-40/883	-55°C to +125°C	68 Lead PGA

HSP45256
BINARY CORRELATOR

Features

- Reconfigurable 256 Stage Binary Correlator
- 1-Bit Reference x 1, 2, 4, or 8-Bit Data
- Separate Control and Reference Interfaces
- 25.6MHz, 33MHz Versions
- Configurable for 1-D and 2-D Operation
- Double Buffered Mask and Reference
- Programmable Output Delay
- Cascadable
- Standard Microprocessor Interface
- Also Available as /883

Applications

- Radar/Sonar
- Spread Spectrum Communications
- Pattern/Character Recognition
- Error Correction Coding

Description

The Harris HSP45256 is a high-speed, 256 tap binary correlator. It can be configured to perform one- or two-dimensional correlations of selectable data precision and length. Multiple HSP45256's can be cascaded for increased correlation length. Unused taps can be masked out for reduced correlation length.

Ordering Information

PART NUMBER	TEMPERATURE RANGE	PACKAGE
HSP45256JC-25	0°C to +70°C	84 Lead PLCC
HSP45256JC-33	0°C to +70°C	84 Lead PLCC
HSP45256GC-25	0°C to +70°C	85 Lead PGA
HSP45256GC-33	0°C to +70°C	85 Lead PGA
HSP45256GM-20/883	-55°C to +125°C	85 Lead PGA
HSP45256GM-25/883	-55°C to +125°C	85 Lead PGA

SPECIAL FUNCTION (Continued)

HSP9520, HSP9521
MULTILEVEL PIPELINE REGISTERS

Features

- Four 8-Bit Registers
- Hold, Transfer and Load Instructions
- Single 4-Stage or Dual-2 Stage Pipelining
- All Register Contents Available at Output
- Fully TTL Compatible
- Three-State Outputs
- High Speed, Low Power CMOS

Applications

- Array Processor
- Digital Signal Processor
- A/D Buffer
- Telecommunication
- Byte Wide Shift Register
- Mainframe Computers

Description

These devices are multilevel pipeline registers implemented using a low power CMOS process. They are pin for pin compatible replacements for industry standard multilevel pipeline registers such as the L29C520 and L29C521. The HSP9520 and HSP5921 are direct replacement for the AM29520 and AM29521 and WS59520 and WS59521.

Ordering Information

PART NUMBER	TEMPERATURE RANGE	PACKAGE
HSP9520CP	0°C to +70°C	24 Lead Plastic DIP
HSP9520CS	0°C to +70°C	24 Lead SOIC
HSP9521CP	0°C to +70°C	24 Lead Plastic DIP
HSP9521CS	0°C to +70°C	24 Lead SOIC

HSP48212
DIGITAL VIDEO MIXER

Features

- 12-Bit Pixel Data
- Two's Complement or Unsigned Data
- 12-Bit Mix Factor
- 13-Bit Signed or Unsigned Three State Output
- Overflow Detection and Output Saturation
- Rounding to 8, 10, 12, or 13-Bits
- Input and Output Pixel Data Synchronous to Clock
- Programmable Pipeline Delay of up to 7 Clock Cycles for Control of Misaligned Input Data
- TTL Compatible Inputs/Outputs
- DC to 40MHz Clock Rate

Applications

- Video Summing (Frame Addition)
- Video Mixing
- Fade In/Out
- Video Switching
- High Speed Multiplying

Description

The Harris HSP48212 is a 68 Lead Digital Video Mixer IC intended for use in multimedia and medical imaging applications.

Ordering Information

PART NUMBER	TEMPERATURE RANGE	PACKAGE
HSP48212VC-40	0°C to +70°C	64 Lead MQFP
HSP48212JC-40	0°C to +70°C	68 Lead PLCC

VIDEO PROCESSING

HSP48410
HISTOGRAMMER/ACCUMULATING BUFFER

Features

- 10-Bit Pixel Data
- 4k x 4k Frame Sizes
- Asynchronous Flash Clear Pin
- Single Cycle Memory Clear
- Fully Asynchronous 16 or 24-Bit Host Interface
- Generates and Stores Cumulative Distribution Function
- Look Up Table Mode
- 1024 x 24-Bit Delay Memory
- 24-Bit Three-State I/O Bus
- DC to 40MHz Clock Rate
- Also Available as /883

Applications

- Histogramming
- Histogram Equalization
- Image and Signal Analysis
- Image Enhancement
- RGB Video Delay Line

Description

The Harris HSP48410 is an 84 lead Histogrammer IC intended for use in image and signal analysis. The on-board memory is configured as 1024 x 24 array. This translates to a pixel resolution of 10-bits and an image size of 4k x 4k with no possibility of overflow.

Ordering Information

PART NUMBER	TEMPERATURE RANGE	PACKAGE
HSP48410JC-33	0°C to +70°C	84 Lead PLCC
HSP48410JC-40	0°C to +70°C	84 Lead PLCC
HSP48410GC-33	0°C to +70°C	84 Lead PGA
HSP48410GC-40	0°C to +70°C	84 Lead PGA
HSP48410GM-33/883	-55°C to +125°C	84 Lead PGA
HSP48410GM-25/883	-55°C to +125°C	84 Lead PGA

HSP48901
3 x 3 IMAGE FILTER

Features

- DC to 30MHz Clock Rate
- Configurable for 1-D and 2-D Correlation/ Convolution
- Dual Coefficient Mask Registers, Switchable in a Single Clock Cycle
- Two's Complement or Unsigned 8-Bit Input Data and Coefficients
- 20-Bit Extended Precision Output
- Standard µP Interface

Applications

- Image Filtering
- Edge Detection/Enhancement
- Pattern Matching
- Real Time Video Filters

Description

The Harris HSP48901 is a high speed 9-Tap FIR Filter which utilizes 8-bit wide data and coefficients. It can be configured as a one dimensional (1-D) 9-tap filter for a variety of signal processing applications, or as a two dimensional (2-D) filter for image processing. In the 2-D configuration, the device is ideally suited for implementing 3 x 3 kernel convolution. The 30MHz clock rate allows a large number of image sizes to be processed within the required frame time for real-time video.

Ordering Information

PART NUMBER	TEMPERATURE RANGE	PACKAGE
HSP48901JC-20	0°C to +70°C	68 Lead PLCC
HSP48901JC-30	0°C to +70°C	68 Lead PLCC
HSP48901GC-20	0°C to +70°C	68 Lead PGA
HSP48901GC-30	0°C to +70°C	68 Lead PGA

VIDEO PROCESSING (Continued)

HSP48908
TWO DIMENSIONAL CONVOLVER

Features

- Single Chip 3 x 3 Kernel Convolution
- Programmable On-Chip Row Buffers
- DC to 32MHz Clock Rate
- Cascadable for Larger Kernels and Images
- On-Chip 8-Bit ALU
- Dual Coefficient Mask Registers, Switchable in a Single Clock Cycle
- 8-Bit Signed or Unsigned Input and Coefficient Data
- 20-Bit Extended Precision Output
- Standard µP Interface
- Low Power CMOS
- Also Available as /883

Applications

- Image Filtering
- Edge Detection
- Adaptive Filtering
- Real Time Video Filters

Description

The Harris HSP48908 is a high speed Two Dimensional Convolver which provides a single chip implementation of a video data rate 3 x 3 kernel convolution on two dimensional data. It eliminates the need for external data storage through the use of the on-chip row buffers which are programmable for row lengths up to 1024 pixels.

Ordering Information

PART NUMBER	TEMPERATURE RANGE	PACKAGE
HSP48908VC-20	0°C to +70°C	100 Lead MQFP
HSP48908VC-32	0°C to +70°C	100 Lead MQFP
HSP48908JC-20	0°C to +70°C	84 Lead PLCC
HSP48908JC-32	0°C to +70°C	84 Lead PLCC
HSP48908GC-20	0°C to +70°C	84 Lead PGA
HSP48908GC-32	0°C to +70°C	84 Lead PGA
HSP48908GM-20/883	-55°C to +125°C	84 Lead PGA
HSP48908GM-27/883	-55°C to +125°C	84 Lead PGA

HSP9501
PROGRAMMABLE DATA BUFFER

Features

- DC to 32MHz Operating Frequency
- Programmable Buffer Length from 2 Words to 1281 Words
- Supports Data Words to 10-Bits
- Clock Select Logic for Positive or Negative Edge System Clocks
- Data Recirculate or Delay Modes of Operation
- Expandable Data Word Width or Buffer Length
- Three-State Outputs
- TTL Compatible Inputs/Outputs
- Low Power CMOS

Applications

- Sample Rate Conversion
- Data Time Compression/Expansion
- Software Controlled Data Alignment
- Programmable Serial Data Shifting
- Audio/Speech Data Processing Video/Image Processing

Description

The HSP9501 is a 10-bit wide programmable data buffer designed for use in high speed digital systems. Two different modes of operation can be selected through the use of the MODSEL input. In the delay mode, a programmable data pipeline is created which can provide 2 to 1281 clock cycles of delay between the input and output data. In the data recirculate mode, the output data path is internally routed back to the input to provide a programmable circular buffer.

Ordering Information

PART NUMBER	TEMPERATURE RANGE	PACKAGE
HSP9501JC-25	0°C to +70°C	44 Lead PLCC
HSP9501JC-32	0°C to +70°C	44 Lead PLCC

DSP Package Selection Guide

Using the Selection Guide:

The first character of each entry indicates the package type, while the number preceding the decimal point details the package lead count. Except for CPGA and TAB packages, the decimal point and succeeding numbers relate to the package body dimensions (e.g. __.14 x 20 = 14mm x 20mm; __.95 = 950 mil sq.; __.3 = 300 mils.

PART NUMBER	MQFP	PLCC	SOIC	PDIP	CPGA	TAB
HMA510		N68.95			G68.A	
HMA510/883					G68.A	
HMU16		N68.95			G68.A	
HMU16/883					G68.A	
HMU17		N68.95			G68.A	
HMU17/883					G68.A	
HSP43124			M28.3	E28.6		
HSP43168	Q100.14x20	N84.1.15			G84.A	
HSP43168/883					G84.A	
HSP43216		N84.1.15			G85.A	
HSP43220	Q100.14x20	N84.1.15			G84.A	S84.A
HSP43220/883					G84.A	
HSP43881		N84.1.15			G85.A	
HSP43881/883					G85.A	
HSP43891	Q100.14x20	N84.1.15			G85.A	
HSP43891/883					G85.A	
HSP45102			M28.3	E28.6		
HSP45106		N84.1.15			G85.A	
HSP45106/883					G85.A	
HSP45116	Q160.28x28				G145.A	S156.A
HSP45116A	Q160.28x28					
HSP45116/883					G145.A	
HSP45240		N68.95			G68.A	
HSP45240/883					G68.A	
HSP45256		N84.1.15			G85.A	
HSP45256/883					G85.A	
HSP48212	Q64.14x14	N68.95				
HSP48410		N84.1.15			G84.A	
HSP48410/883					G84.A	
HSP48901		N68.95			G68.A	
HSP48908	Q100.14x20	N84.1.15			G84.A	
HSP48908/883					G84.A	
HSP50016		N44.65			G48.A	
HSP9501		N44.65				
HSP9520			M24.3	E24.3		
HSP9521			M24.3	E24.3		

Package outlines and dimensions are available in Section 10.

TELECOM 5

PRODUCT SELECTION GUIDE

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SUBSCRIBER LINE INTERFACE CIRCUIT

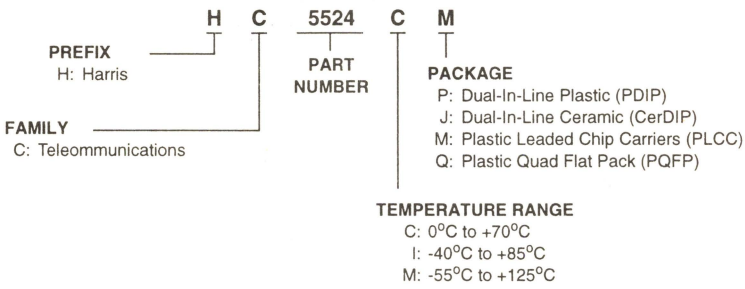
HC-5513
SUBSCRIBER LINE INTERFACE CIRCUIT (SLIC)

AnswerFAX Document # 3963

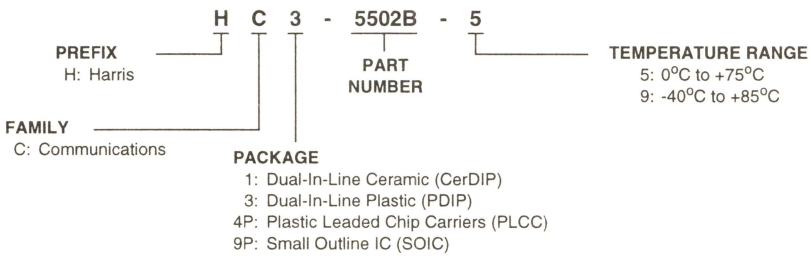
- Programmable Current Feed
- Ground Key and Ring Trip Detection
- On-Hook Transmission
- Wide Battery Voltage Range (-24V to -56V)
- Low Standby Power
- Meets TR-NWT-000057 Transmission Requirements
- -40°C to +85°C Ambient Temperature Range
- Applications
  - Digital Loop Carrier Systems
  - Fiber-In-The-Loop ONUs

Telecom Ordering Information

"NEW" HARRIS PRODUCT CODE EXAMPLE



"OLD" HARRIS PRODUCT CODE EXAMPLE



CD, CD74HC(T) NOMENCLATURE GUIDES

CD22354 A D

PART NUMBER
CDXXXX
CD74HC(T)XXXX

REVISION
A: 1st
B: 2nd etc.

PACKAGE/OPTION	SUFFIX LETTER
Dual-In-Line Sidebrazed Ceramic DIP	D
Dual-In-Line Plastic DIP	E
Leadless Chip Carrier	J
Small Outline Plastic SOP	M
Plastic Leaded Chip Carrier PLCC	N
Metric Plastic Quad Flatpack MPQFP	Q
Chip (When Applicable)	H
Enhanced Product Screening i.e. Burn-In (Optional for D, E Package Types)	X
Single-In-Line Package (SIP)	Z
Electrical Option	1, 2, 4

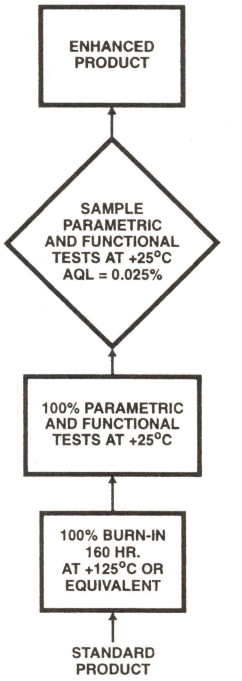
Extra Value Screening

Telecom product with extra value screening has an X added to the standard type number in the price list, and is also branded as such. A white dot will indicate location of Pin 1.

Example:

A CD22100E with Extra Value screening is designated CD22100EX in the price list. It is branded CD22100EX plus a white dot at pin number 1.

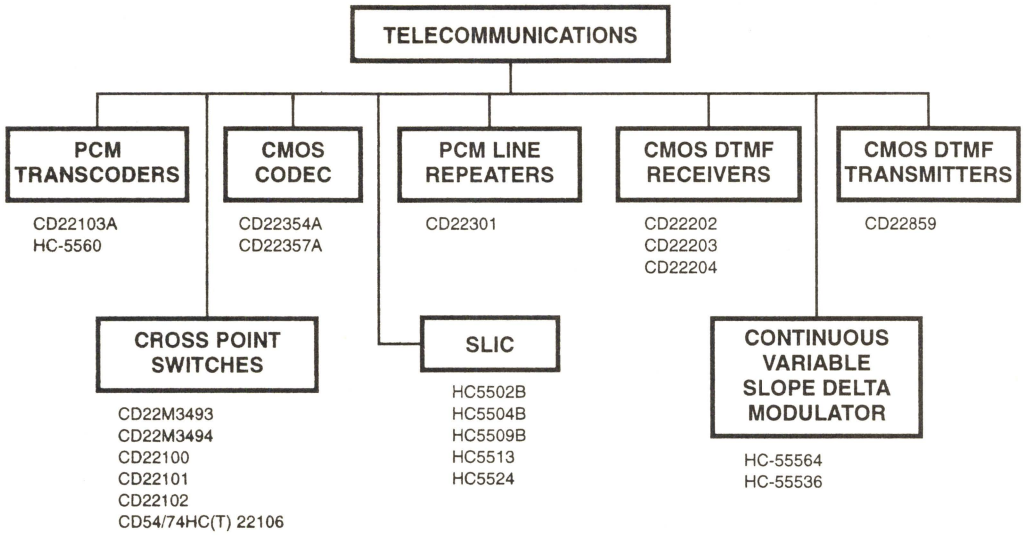
PRODUCT FLOW



PRODUCTION STATE OR PROCESS

QUALITY ASSURANCE STEP

Telecommunications Product Selection Tree



ANALOG INTERFACE AT CENTRAL OFFICE OR PBX SWITCH END

- SLIC - Subscriber Line Interface Circuit
  - Interfaces Voice/Status Signals Between Residential Business Telephone and PBX/Central Office (CO) Switch
  - Every Telephone Requires a SLIC to Monitor It
  - Provides BORSHT Functions to Subscriber Loop
  - Monolithic Solution to Transformer Based Application
- CODEC - CODer/DECoder
  - Non-Linear Analog to Digital (Encode) and Digital to Analog (Decode) Converter for Voice
  - Converts Telephone Voice Signals, Via the SLIC, to/from Digital PCM Format for Transmission on Digital PCM Bus
  - Assigns Protocol for Timing Multiple Telephone Calls
- Crosspoint Switches
  - Matrix of Analog Switches with Digital Control to Interconnect Audio, Voice, Computer, PBX, Central Office Telephone Signals
- Surgectors
  - See Transient Voltage Suppression for Details
- Tone Receivers
  - Detects/Decodes Standard DTMF Sinusoidal Audio Tones for Call Routing By The Central Office Computer or for Subscriber End Instrument Control, i.e., Answering Machine, Fax

DIGITAL INTERFACE

- PCM Repeater - Pulse Code Modulation
  - Digital-Digital Converter for Signal Equalization, Pulse Shaping, Clock Extraction, Timing and Threshold Detection
  - For T1 (1.54MHz), T148 (2.37MHz), and CCITT (EUROPEAN 2.048MHz), Digital PCM Transmission Lines
- PCM Transcoders - Pulse Code Modulation
  - Converts Digital PCM Signal to Special Digital Codes to Maintain Signal Integrity Over Long Transmission Distances
  - For T1 (1.544MHz), T1C (3.152MHz), T2 (6.3212MHz) and CCITT (2.048MHz) "PCM HIGHWAY" Transmission Lines

ANALOG INTERFACE AT SUBSCRIBER END

- DTMF Circuits - Dual Tone Multi Frequency
- Tone Generator
  - Generates Standard DTMF Sinusoidal Audio Tones for the Standard Telephone Pushbutton Keypad

GENERAL INTERFACE

- CVSD - Continuously Variable Slope Deltamodulation
  - Analog-Digital (ENCODER) and Digital-Analog (DECODER) Converter for Voice
  - Converts Voice Signals to Serial Non-return to Zero (NRZ) Format and Vice Versa
  - Use in Telephone Systems, Radios and Secure Communications

ANALOG INTERFACE AT CENTRAL OFFICE SWITCH OR PBX SWITCH END

SLIC SUBSCRIBER LINE INTERFACE CIRCUITS					
PART NUMBER AnswerFAX DOCUMENT NUMBER	**HC-5502B 2884**	**HC-5504B 2886**	**HC-5509B 2799**	**HC-5513 3963**	**HC-5524 2798**
Application	PABX	PABX	CO	FITL/PABX	PABX
Inc Combo					
Inc Ring Relays					
Dual Channel					
Relay Drivers	Ring	Ring	Ring +1	Ring	Ring +1
Ringing Schemes	Gnd/Tip	All	All	All	All
Polarity Reversal					
-28V/-48V				X	X
Constant Voltage Feed	X	X	X		X
Constant Current Feed			X	X	X
Programmable Feed			X	X	X
Current Limiting	X	X	X	X	X
Loop Current (mA)	30	40	20 to 60	20 to 30	20 to 60
Suitable for Nominal Battery Voltage of: (V)	-48	-48	-48	-48	-24
Power Diversion Feature					
Tip Open/Ground Start Function					
Tip and Ring Open			X	X	X
Loop Current Detector	X	X	X	X	X
Ground Key Detector	X	X	X		X
Parallel Detector Outputs	X	X	X	X	X
Ring Trip Detector	X	X	X	X	X
Thermal Shutdown			X	X	X
Thermal Shutdown Detector			X		X
On Hook Transmission	X	X	X	X	X
Saturation Guard	X	X	X	X	X
Gains Fixed on Chip	X	X	X	X	X
-40°C to +85°C	X	X	X	X	X
Standard Packages	PDIP	PDIP	PDIP	PDIP	PDIP
	PLCC	PLCC	PLCC	PLCC	PLCC
	SO	SO	SO		SO

CMOS CODECs COMPLIMENTARY METAL-OXIDE SEMICONDUCTOR				
PART NUMBER	**FEATURES**	**CLOCK RATES**	**SUPPLY VOLTAGE**	**PACKAGE**
NON-LINEAR ANALOG TO DIGITAL AND DIGITAL TO ANALOG CONVERTER FOR VOICE AND PCM (PULSE CODE MODULATION) SIGNALS				
CD22354A (μ-Law) CD22357A (A-Law)	• Meets or Exceeds All AT&T D3/D4 Specs CCITT Recommendations • Complete CODEC and Filtering Systems - No External Components for Sample-and-Hold and Auto-Zero - Receive Output Filter with SIN X/X Correction and Additional 8kHz Suppression • Variable Data Clocks - From 64kHz to 2.1MHz • Synchronous and Asynchronous Operation • TTL or CMOS Compatible Logic • ESD Protection on All Inputs and Outputs • Adjustable Gain for Transmit Input	64kHz to 2.1MHz	±5V ±5% at 90mW (Max)	16 Lead DIP (E)

ANALOG INTERFACE AT CENTRAL OFFICE SWITCH OR PBX SWITCH END (Continued)

CROSSPOINT SWITCHES								
TYPE	FEATURES	CONFIGU-RATION	R_{ON} TYP at 12V	ΔR_{ON} TYP at 12V	FREQ. RESPONSE TYP -3dB 14V	CROSSTALK TYP -40dB 14V	SUPPLY VOLTAGE	PACKAGE
BIMOS-E CROSSPOINT SWITCHES WITH CONTROL INPUT MEMORY								
CD22M3493 CD22M3494	• Independent Address Latches • Manual and Automatic Power-On Resets • Crosstalk: -90db (Min) at 10kHz • Parallel Input Addressing • HC/HCT Ground-Referenced Inputs Available • 2kV Minimum ESD Protection • Latch-Up Current: 50mA Min • Pin and Functionally Compatible with the SGS M3493/M3494 and Mitel MT8812/MT8816	12 x 8 x 1 16 x 8 x 1	36Ω	6Ω	45MHz	3MHz	4V to 16V CD22M3494 4V to 15V CD22M3493	40 Lead DIP (E) 44 Lead PLCC (Q)
CMOS CROSSPOINT SWITCHES WITH CONTROL MEMORY								
CD22100	• "Built-In" Control Latches • Large Analog Signal Capability $\pm V_{DD}/2$ • 10MHz Switch Bandwidth • High Linearity - 0.5% Distortion Typ at f = 1kHz, $V_{IN} = 5V_{P-P}$, V_{DD} = 10V, and R_L = 1kΩ • Standard CMOS Noise Immunity • 100% Tested for Maximum Quiescent Current at 20V	4 x 4 x 1	75Ω	18Ω	40MHz	1.5MHz	3V to 18V	16 Lead DIP (D, E or F)
CD22101	• Strobed Control Input • "Built-In" Latched Inputs • Large Analog Signal Capability $\pm V_{DD}/2$ • 10MHz Switch Bandwidth • High Linearity - 0.25% Distortion Typ at f = 1kHz, $V_{IN} = 5V_{P-P}$, $V_{DD} - V_{SS}$ = 10V, and R_L = 1kΩ • Standard CMOS Noise Immunity	4 x 4 x 2	75Ω	8Ω	40MHz	2.5MHz	3V to 18V	24 Lead DIP (E or F)
CD22102	• Same as CD22101, but has Set/Reset Flip-Flop Control Input Instead of Strobed Control Input	4 x 4 x 2	75Ω	8Ω	40MHz	2.5MHz	3V to 18V	24 Lead DIP (E or F)
CD54/74HC(T)22106	• 64 Analog Switches in an 8 x 8 x 1 Array • On-Chip Line Decoder and Control Latches • Automatic Power-Up Reset by Using a 0.1μF Capacitor at the MR Pin • R_{ON} Resistance 95Ω Max at V_{CC} = 4.5V • Analog Signal Capability $V_{DD}/2$	8 x 8 x 1	64Ω	25Ω	6MHz	7MHz	2V to 10V	28 Lead DIP (E)

NOTE: High Performance Analog Switches Matrix for PBX, Studio, Audio Switching, and Multisystem Bus Interconnects.

ANALOG INTERFACE AT SUBSCRIBER END

CMOS DTMF RECEIVERS				
TYPE	**FEATURES**	**OUTPUT 3-STATE OUTPUT CODE**	**SUPPLY VOLTAGE**	**PACKAGE**
CD22202	• Detects Either 12 or 16 Standard DTMF Signals • Central-Office Quality • No Front-End Band Splitting Filters Required • Single, Low-Tolerance, 5V Supply • Uses Inexpensive 3.579545MHz Crystal for Reference • Excellent Speech Immunity • Synchronous or Handshake Interface • Three-State Outputs	4-Bit Hexadecimal or Binary Coded 2-of-8	5V ±10%	18 Lead DIP (E)
CD22203	• Same as CD22202, but also has Early Detect Output	4-Bit Hexadecimal or Binary Coded 2-of-8	5V ±10%	18 Lead DIP (E)
CD22204	• No Front-End Band Splitting Filters Required • Single, Low-Tolerance, 5V Supply • Three-State Outputs for Microprocessor-Based Systems • Detects all 16 Standard DTMF Digits • Uses Inexpensive 3.579545MHz Crystal for Reference • Excellent Speech Immunity • Outputs in 4-Bit Hexadecimal Code	4-Bit Hexadecimal Only	5V ±10%	16 Lead DIP (E) 24 SOIC (M)

CMOS DTMF TRANSMITTERS				
TYPE	**FEATURES**	**OUTPUT (MIN)**	**SUPPLY VOLTAGE**	**PACKAGE**
CD22859	• Mute Drivers on Chip • Device Power Can Either be Regulated DC or Phone Loop Current • Use of an Inexpensive 3.579545MHz TV Crystal Provides High Accuracy and Stability for All Frequencies	350mV into 82Ω	2.5V to 10V	16 Lead DIP (E)

NOTE: Detects and Generates Special Tones for Standard Telephone Touch Tone Dialing Keypad.

DIGITAL INTERFACE

PCM LINE REPEATERS				
TYPE	**FEATURES**	**OUTPUT**	**SUPPLY VOLTAGE**	**PACKAGE**
BIPOLAR				
CD22301	• Automatic Line Buildout • for T1 1.544Mbits/s Bipolar Carrier System • For T148 2.37Mbits/s Ternary Carrier System • For CCITT 2.048Mbits/s Bipolar Carrier System	Buffered	5.1V ±5%, 30mA Max	18 Lead DIP (E)

NOTE: Digital to Digital Converter to Bolster and Reshape Digital PCM Signals Distorted by Long Transmission Over PCM Bus Lines.

DIGITAL INTERFACE (Continued)

PCM TRANSCODERS					
TYPE	**FEATURES**	**OUTPUT**	**CODES**	**SUPPLY VOLTAGE**	**PACKAGE**
HC-5560	• Mode Selectable Coding • North American and European Compatibility • Simultaneous Encoding and Decoding • Asynchronous Operation • Loop-Back Control • Transmission Error Detection • Alarm Indication Signal • Replaces MJ1440, MJ1471, and TCM2201 Transcoders	3.2mA at 0.4V	AMI (T1 and T1C) B6ZS (T2) B8ZS (T1) HDB3 (PCM30)	5V at 10mA Typ	20 Lead DIP
CD22103A	• Simultaneous Encoding and Decoding • HDB3 Coding and Decoding for Data Rates from 50kbits/s to 10Mbits/s in a Manner Consistent with CCITT G703 Recommendations • HDB3/AMI Transmission Coding/Reception Decoding with Code Error Detection is Performed in Independent Coder and Decoder Sections • All Transmitter and Receiver Inputs/Outputs are TTL Compatible • Internal Loop Test Capability	1.6mA at 0.5V	HDB3/AMI per CCITT G703 Annex Recommendation	5V ±10% at 100mA Max	16 Lead DIP (D or E)

NOTE: Unipolar to Bipolar Digital to Digital Converter for More Efficient Long Line Transmission of digital PCM signals.

GENERAL INTERFACE

CVSD CONTINUOUS VARIABLE SLOPE DELTA MODULATOR				
TYPE	**FEATURES**	**CLOCK RATES**	**SUPPLY VOLTAGE**	**PACKAGE**
HC-55564	• Modulator/Demodulator Functions • All Digital • Requires Few External Parts • Low Power Drain: 1.5mW Typical from Single 3V - 7V Supply • Time Constants Determined by Clock Frequency; No Calibration or Drift Problems; Automatic Offset Adjustment • Half Duplex Operation Under Digital Control • Filter Reset Under Digital Control • Automatic Overload Recovery • Automatic "Quiet" Pattern Generation • AGC Control Signal Available	9kHz to 64kHz	3.3V to 6V at 1.5mA Max	16 Lead SOIC 14 Lead DIP
HC-55536	• Demodulator Only Functions • All Digital • Requires Fewer External Parts • Low Power Drain: 1.5mW from Single 3V - 7V Supply • Time Constants Determined by Clock Frequency; No Calibration or Drift Problems; Automatic Offset Adjustment • Filter Reset Under Digital Control • Automatic Overload Recovery • Automatic "Quiet" Pattern Generation	9kHz to 64kHz	3.3V to 6V at 1.5mA Max	14 Lead DIP

NOTE: A Real Time Voice to Digital (Encoder) and Digital to Voice (Decoder) Converter.

Telecom Package Selection Guide

Using the Selection Guide:

The first character of each entry indicates the package type, while the number preceding the decimal point details the package lead count. Except for Can packages, the decimal point and succeeding numbers specify the package width in inches (e.g. __.15 = 150 mil width).

PART NUMBER	PDIP	MQFP	SOIC	PLCC	CDIP	SIDEBRAZE	CAN
CD22100	E16.3	-	-	-	F16.3	D16.3	-
CD22101	E24.6	-	-	-	F24.6	-	-
CD22102	E24.6	-	-	-	F24.6	-	-
CD22103A	E16.3	-	-	-	-	D16.3	-
CD22202	E18.3	-	-	-	-	-	-
CD22203	E18.3	-	-	-	-	-	-
CD22204	E14.3	-	M24.3	-	-	-	-
CD22301	E18.3	-	-	-	-	-	-
CD22354A	E16.3	-	-	-	-	-	-
CD22357A	E16.3	-	-	-	-	-	-
CD22859	E16.3	-	-	-	-	-	-
CD22M3493	E40.6	-	-	N44.65	-	-	-
CD22M3494	E40.6	-	-	N44.65	-	-	-
CD74HC22106	E28.6	-	-	-	-	-	-
HC-5502B	E24.6	-	M24.3	N28.45	F24.6	-	-
HC-5504B	E24.6	-	M24.3	N28.45	F24.6	-	-
HC-5504DLC	E24.6	-	M24.3	N28.45	F24.6	-	-
HC-5509B	E28.6	-	M28.3	N44.65	F28.6	-	-
HC-5524	E28.6	-	M28.3	N44.65	F28.6	-	-
HC-55536	E14.3	-	-	-	F14.3	-	-
HC-55564	E14.3	-	M16.3	-	F14.3	-	-
HC-5560	E20.3	-	-	-	-	-	-
HC5513	E22.4	-	-	N28.45	-	-	-

EXAMPLE: M 16 .15

PACKAGE TYPE — LEAD COUNT — BODY WIDTH

Package outlines and dimensions are available in Section 10.

INTELLIGENT POWER ICs 6

PRODUCT SELECTION GUIDE

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New Intelligent Power Products

FET DRIVERS

HIP0063
HEX MOSFET DRIVER WITH DIAGNOSTICS

AnswerFAX Document # 4009

- Six Channel MOSFET Driver with Gate Drive Control by Serial (SPI) or Parallel Interface and an Option for PWM Logic Switching Control
- Drain Monitor Provides Fault Detection and Voltage Clamp for Each Channel
- Output Voltage Zener Clamp . . . . . 67V (Typ)
- 5V CMOS Logic Level Input Control
- V_{CC} Logic Level Power Supply
- 5V V_{CC} Logic Power Supply
- Turns Off Gate Drive for Low or Loss of V_{CC}
- V_{PWR} System Level Power Supply Management
- 5.5 V to 17V Battery/System Level Power Supply Monitor
- Over-Voltage Shutdown . . . . . 35V (Typ)

HIP4082
80V FULL BRIDGE FET DRIVER

AnswerFAX Document # 3676

- 80V Full Bridge Driver
- Gate Driver 1.25A
- Drives 1000pF Load in Free Air at 50°C with Rise and Fall Times of Typically 15ns
- User-Programmable Dead Time (0.1µs to 4.5µs)
- DIS (Disable) Overrides Input Control
- Input Logic Thresholds Compatible with 5V to 15V Logic Levels
- Shoot-Through Protection
- Under Voltage Protection
- Individual Control of Each Gate Driver
- True High Side Drive Level Shifting Circuit

HIP2030
30V MCT/IGBT GATE DRIVER

AnswerFAX Document # 3691

- ± Polarity Gate Drive
- High Output Voltage Swing 30V
- Peak Output Current 6.0A
- Fast Rise Time . . . . . 200ns at 60,000pF
- Ability to Interface and Drive P-MCTs
- Programmable Minimum ON/OFF Time
- Gate Output Inhibit Latch
- 5V Reference . . . . . Sinks Up to 30mA
- High Side Charge Pump
- 120kHz Operation . . . . . at 15,000pF

HIP5500
500V HALF BRIDGE MOSFET DRIVER

AnswerFAX Document # 3210

- 500V Half Bridge - Power Supply Specific
- Gate Drive 2A
- PWM Oscillator 300kHz
- Shoot-Through Protection
- Soft Start
- Fault Flag
- Drives Buffered FET RFV10N50BE

HIP4080/A, HIP4081/A
80V FULL BRIDGE FET DRIVERS

AnswerFAX Document # 3178 (HIP4080), 3658 (80A)
AnswerFAX Document # 3556 (HIP4081), 3659 (81A)

- $80V_{DC}$ Full Bridge Driver
- Charge Pump for Startup/DC Operation
- Gate Drive 2.5A
- 1MHz PWM Frequency
- T_R, T_F at 1000pF 10ns
- Shoot-Through Protection
- User Programmable Dead Time
- Low Propagation Delays 70ns
- HIP4080A/81A with Under Voltage Protection

ICL7667
DUAL POWER MOSFET DRIVER

AnswerFAX Document # 2853

- High Side Driver
- Peak Output Source Current 1.5A
- Peak Output Sink Current 1.5A
- Switching Frequency 200kHz
- Quiescent Supply Current 5mA
- Fall Time 30ns
- TTL/CMOS Input Compatible . . . . . Yes
- Maximum Supply Range 15V
- Configuration . . . . . Dual

FET ARRAYS

HIP0061
THREE COMMON SOURCE MOSFET

AnswerFAX Document # 3982

- Three 3.5A Power MOS N-Channel Transistors
- Output Voltage to 60V
- $r_{DS(ON)}$ . . . . . .0.225Ω Max Per Transistor at V_{GS} = 10V
- Pulsed Current. . . . . .10A Each Transistor
- Avalanche Energy . . . . . .100mJ Each Transistor
- Grounded Tab Eliminates Heat Sink Isolation
- 2kV ESD Protected

HIP2060
HALF BRIDGE POWER MOSFET ARRAY

AnswerFAX Document # 3983

- Two 10A Power MOS N-Channel Transistors
- Output Voltage to 60V
- $r_{DS(ON)}$ . . . . . 0.125Ω Max Per Transistor at V_{GS} = 15V
- $r_{DS(ON)}$ . . . . . 0.15Ω Max Per Transistor at V_{GS} = 10V
- Pulsed Current . . . . . 25A Each Transistor
- Avalanche Energy. . . . . 120mJ Each Transistor
- Grounded Tab Eliminates Heat Sink Isolation

FULL BRIDGE POWER DRIVERS

HIP4020
HALF AMP FULL BRIDGE POWER DRIVER

AnswerFAX Document # 3976

- Two Independent Controlled Complementary Half H-Drivers
- Split ±Voltage Power Supply Option for Output Drivers
- Low Voltage Operation . . . . . Down to 2.5V
- Low Standby Current
- CMOS/TTL Compatible Input Logic
- Over-Temperature Shutdown Protection
- Direction, Braking and PWM Control

HIGH SIDE DRIVERS

HIP1030, HIP1031
HIGH SIDE DRIVERS

AnswerFAX Document # 2788 (HIP1030)
AnswerFAX Document # 3596 (HIP1031)

- HIP1030/31 Op. Temp Range . . . . . .-40°C to +125°C
- HIP1030 Saturation Voltage. . . . . 1V Max at 1A
- HIP1031 Saturation Voltage. . . . . .1V Max at 0.6A
- HIP1030 Current Switching Capability. 1A
- HIP1031 Current Switching Capability. 0.6A
- HIP1030/31 Power Supply Range . . . . . .4.5V to 25V
- HIP1030/31 Peak Load Dump 60V
- HIP1030/31 Over Voltage Shutdown . . . . . Yes
- HIP1030/31 Over Current Limiting. . . . . Yes
- HIP1030/31 Thermal Limiting . . . . . Yes

HIP1090
HIGH SIDE DRIVER

AnswerFAX Document # 3398

- ±90V Transient Suppression
- 1A Current Load Capability
- Over Voltage Shutdown Protection . . . . . 16V to 19V
- Short Circuit Current Limiting
- Over Temperature Shutdown Protection at T_J = 150°C
- -40°C to +125°C Operating Temperature
- Low Input To Output Voltage Drop with Controlled Saturation Detector for
  - Fast Current Turn-Off
  - Reduced No-Load Idle Current

PROTECTION CIRCUITS

SP720, SP721
ELECTRONIC PROTECTION ARRAYS

AnswerFAX Document # 2791 (SP720)
AnswerFAX Document # 3590 (SP721)

- Peak Current Capability . . . . . ±2A
- Transient Suppression. 15kV
  - MIL-STD-883 Method 301S
- Single-Ended Voltage . . . . . to 30V
- Differential Voltage Range . . . . . ±15V
- Fast Rise Time. 6ns
- Low Input Leakage (Typ) 1nA
- Low Input Capacitance (Typ). 3pF
- Operating Temperature Range . . . . . -40°C to +105°C
- Coverage:
  - (SP720) . . . . . 14 Lines
  - (SP721) . . . . . 6 Lines

REGULATORS

CA3277
LINEAR REGULATOR

AnswerFAX Document # 2792

- Dual $5V_{DC}$
- Outputs 100mA
- Enabled Output
- Microprocessor/Microcontroller Interface Compatible
- Serial Data Buffers for Remote Applications

HIP5061
7A, PWM REGULATOR

AnswerFAX Document # 3390

- Current Mode Control
- Input Operating Voltage Range 10.8V to 60V with Internal Clamp
- DMOS Transistor 60V/7A
- PWM Operation 250kHz
- LOW Switching Losses . . . . . T_R, T_F <10ns
- Over Current Protection
- Over Temperature Shutdown
- TO-220-7L Package

HIP5600
AC OR DC TO DC 3-TERMINAL REGULATOR

AnswerFAX Document # 3270

- Direct Off-Line AC or DC Operation
- Quiescent Current 400µA
- Output Voltage Range. . . . . 1.2V to 350V (V_{PEAK})
- Continuous Output Current 10mA
- Peak Output Current 40mA
- Over Temperature Shutdown
- AC Input . . . . . 80V to 280V
- DC Input . . . . . 50V to 400V
- Output Current Extendable with External Circuitry
- UL Recognized

Intelligent Power Evaluation Boards

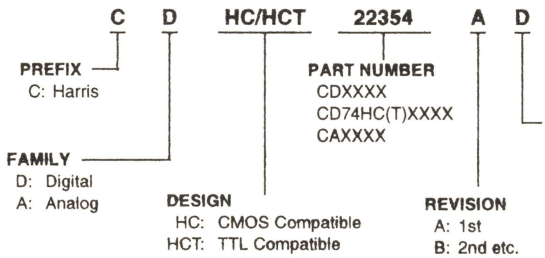
PART NUMBER	DESCRIPTION	FEATURES
HIP2030EVAL (Note 1)	IGBT/MCT Driver	• 3000VDC Isolation • 10,000V/µS dv/dt Capability • Peak Output Current . . . . . 6.0A • Fast Rise Time. . . . . 200ns at 60,000pF • 120kHz Gate Switching . . . . . C_{LOAD} at 15,000pF
HIP2500EVAL	General Purpose Evaluation Board MOSFETs or IGBTs and Diodes	• 500V • 2.0A Peak Current • 400kHz Operation • Jumpers to Change Configurations • Accepts TO-247 and TO-248 Devices
HIP4080AEVAL	HIP4080 or HIP4081 General Purpose Evaluation Board	• Breadboard Area • IRF540 H-Bridge • CD4069 Oscillator
HIP4080AEVAL2	Audio Amplifier - Class D (HIP4080A)	• 200W Nominal Power Output • IMD Distortion at 0.3% • Frequency Response 20-20kHz at ±0.2dB • THD+N at <0.8% at 4W at 4Ω • Four-Pole Butterworth Filter Output
HIP4081EVAL2	ZVS HIP4081 DC to DC Converter	• Phase Shift Zero Voltage Switching • -36V to -72V Input, +5V Output • Reduced Switching Losses, EMI and RFI • High Frequency Operation, 500kHz • Surface Mount Design, 50W
HIP4081AEVAL3	HIP4081 Dual Synchronous Rectified Buck Converter	• V_{IN} = 15V to 40VDC; V_{OUT1} = 5VDC; V_{OUT2} = 3VDC • I_{OUT1} = 10A; I_{OUT2} = 10A; FREQ = 100kHz • Ripple Voltage = 50mV; Ripple Current = 10% (I_{OUT}) • >85% Efficiency at 10A
HIP4082EVAL	DC to AC Inverter, 140W Using HIP4082 and HIP2500 MOSFET Drivers and 7555 Timer	• Two-Stage Inverter with 60kHz Isolation Transformer • 12VDC to 120/220VAC at 140W.
HIP5023EVAL		
HIP5061EVAL	50W Current Mode Controlled PWM Boost Regulator	• 250kHz Operation • 28V at 1.8A Output; V_{IN} at 12VDC • Peak Current of 7A at <30% Duty Cycle
HIP5500EVAL	General Purpose Evaluation Board	• 500V • 2A Peak Current • Adjustable Dead Time Control
HIP5600EVAL1	High Voltage DC to DC Evaluation Board	• 50VDC to 450VDC Input • Output Adjusted to 15VDC
HIP5600EVAL2	50V to 132V AC to DC Evaluation Board	• 50VAC to 130VAC Input • Output Adjusted to 15VDC
HIP5600EVAL3	50V to 280V AC to DC Evaluation Board	• 50V to 280VAC Input • Output Adjusted to 15VAC
HIP7030EVAL		
HIP7038EVAL		

NOTE:

1. Literature Available on AnswerFAX #3918

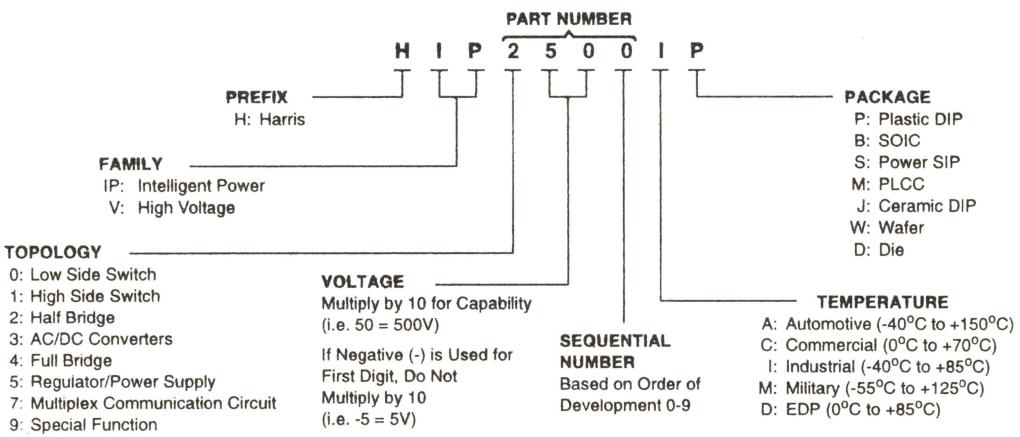
Intelligent Power Ordering Information

CD, CD74HC(T), CA NOMENCLATURE GUIDES



PACKAGE/OPTION	SUFFIX LETTER
Dual-In-Line Sidebrazed Ceramic DIP	D
Dual-In-Line Plastic DIP	E
Leadless Chip Carrier	J
Small Outline Plastic SOP	M
Plastic Leaded Chip Carrier PLCC	N
Metric Plastic Quad Flatpack MPQFP	Q
Chip (When Applicable)	H
Enhanced Product Screening i.e. Burn-In (Optional for D, E Package Types)	X
Single-In-Line Package (SIP)	Z
Electrical Option	1, 2, 4

GENERAL ORDERING INFORMATION
PRODUCT CODE EXAMPLE



PREFIX DEVICE SUFFIX

ICL 7115 C D L /883B

DEVICE FAMILY

BASIC DEVICE TYPE

HIGH RELIABILITY DESIGNATOR
/883B: Fully Compliant to MIL-STD-883 Class B/QML

NUMBER OF PINS

Pin Count Designators

SUFFIX	NUMBER OF PINS
A	8
B	10
C	12
D	14
E	16
F	22
G	24
H	42
I	28
J	32
K	35
L	40
N	18
P	20
R	3
W	10 (0.230″ Pin Circle, Isolated Case)
44	44

TEMPERATURE RANGE
- C: Commercial, 0°C to +70°C
- I: Industrial, -25°C to +85°C or -40°C to +85°C (Specified on Data Sheet
- M: Military, -55°C to +125°C

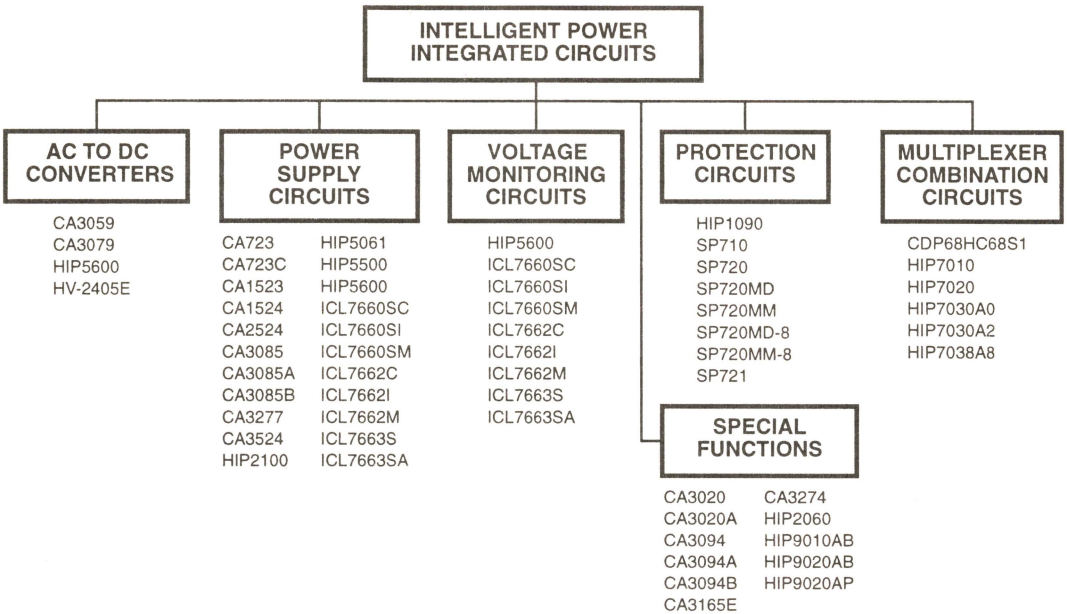
PACKAGE
- B: Small Outline, SOIC
- D: Ceramic (Side-Brazed) Dual-In-Line
- F: Ceramic Flatpack
- I: 16 Pin (0.6 x 0.7 Pin Spacing) Hermetic Hybrid DIP
- J: CERDIP Dual-In-Line
- L: Leadless Ceramic Quad Pack
- M: Plastic Quad Pack (PQFP)
- P: Plastic Dual-In-Line
- S: TO-52
- T: TO-5 (Also TO-78, TO-99, TO-100)
- U: TO-72 (Also TO-18, TO-71)
- Z: TO-92
- /W: Wafer
- /D: DICE

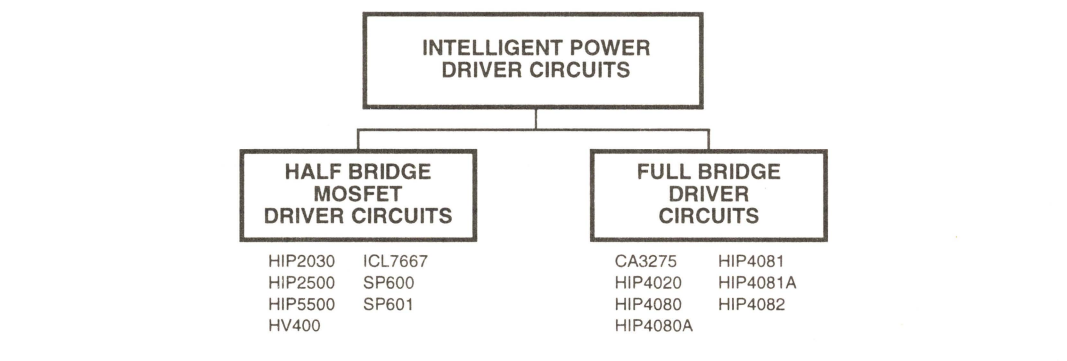
EXCEPTIONS TO PACKAGE TYPE DESIGNATOR

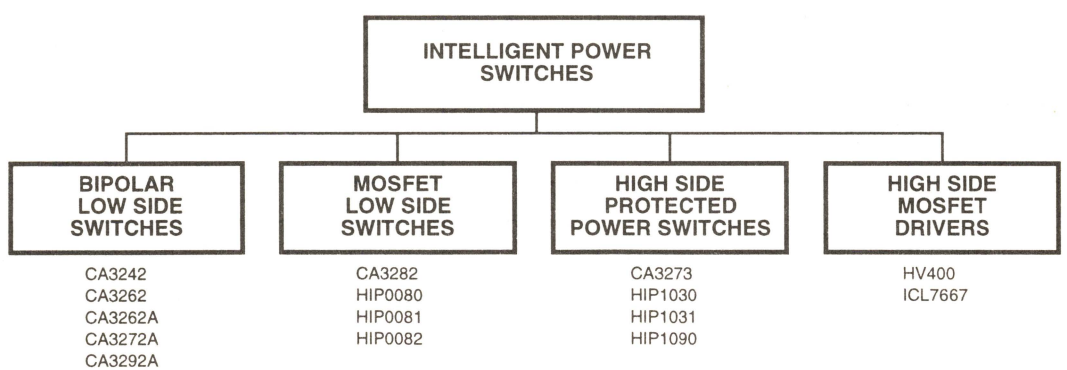
DG (ANALOG SWITCH AND MUX) SERIES
- A: 10 Pin Metal Can
- L: 14 Pin Flatpack
- P: Ceramic Dual-In-Line Package (special order only)
- K: CERDIP
- Y: SOIC

AD (D/A CONVERTER) SERIES
- H: TO-52
- D: CERDIP, Ceramic Dual-In-Line Package
- N: Epoxy Dual-In-Line Package
- R: TO-92

Intelligent Power Product Selection Tree







Intelligent Power Selection Guide

BIPOLAR LOW SIDE SWITCHES

BIPOLAR TYPES	TYPE NUMBERS				
	CA3242 QUAD	CA3262 QUAD	CA3262A QUAD	CA3272A QUAD	CA3292A QUAD
Max. Output Voltage, No Load	50V	60V	60V	60V	32V Typ (Clamp)
Max. Rated DC Load Current	0.6A	0.7A	0.7A	0.7A	0.7A
Max. V_{SAT} Output Voltage	0.8V at 0.6A	0.6V at 0.6A	0.5V at 0.6A	0.4V at 0.5A	0.4V at 0.5A
Max. Load Switching Voltage, V_{CESUS} or V_{CLAMP} Limited	35V	40V	40V	40V	28V
Output Current Limiting and/or Shutdown Protection	1.4A (Latches-Off)	1.6A	1.3A	1.2A	1.2A
Output Thermal Limiting and/or Shutdown Protection (Temperature T_J)	No	+155°C	+155°C	+165°C	+165°C
Thermal Shutdown, Hysteresis	No	No	No	15°C	15°C
Fault Indicator Flag	No	No	No	Yes	Yes
Diagnostic Feedback	No	No	No	No	No
Temperature Range -40°C to ___°C	105	85	125	125	125
Package	16 DIP	16 DIP	16 DIP and 28 PLCC	28 PLCC	28 PLCC

BIMOS LOW SIDE SWITCHES

MOSFET TYPES	TYPE NUMBERS			
	HIP0080 QUAD	HIP0081 QUAD	HIP0082 QUAD	CA3282 OCTAL
Max. Output Voltage, No Load	36V Typ (Clamp)	80V Typ (Clamp)	80V Typ (Clamp)	32V Typ (Clamp)
Max. Rated DC Load Current	1A	2A	2A and 5A	1A
Max. R_{ON} Output Resistance	1.0Ω at 0.5A	0.5Ω at 1A	0.57Ω at 2A	1.0Ω at 0.5A
Max. Load Switching Voltage (V_{CESUS} or V_{CLAMP} Limited)	27V	73V	72V	30V
Output Current Limiting and/or Shutdown Protection	1.8A (Latches-Off)	3.5A (Latches-Off)	2.7A and 5.7A (Latches-Off)	1.5A (Latches-Off)
Output Thermal Limiting and/or Shutdown Protection, T_J	+150°C	+150°C	+165°C (Flag)	No
Thermal Shutdown, Hysteresis	15°C	15°C	15°C	No
Fault Indicator Flag	Yes	Yes	Yes	Yes
Diagnostic Feedback	Yes	Yes	Yes	Yes
Temperature Range -40°C to ___°C	125	125	125	125
Package	28 PLCC	15 SIP	15 SIP	15 SIP

HALF BRIDGES MOSFET DRIVER CIRCUITS

TYPE	FUNCTION	MAX BUS (V)	RECOMMENDED SUPPLY VOLTAGE	MAX PULSED GATE CURRENT	MAX PWM FREQUENCY	SHOOT THRU PROTECTION	PACKAGE	RECOMMENDED APPLICATION
HIP2030	P-Channel Power Driver	$30V_{DC}$	$8V_{DC}$ to $15V_{DC}$	6A	180kHz	Yes	28 Lead PLCC	Motor Control
HIP2500	N-Channel Half Bridge	$500V_{DC}$	$10V_{DC}$ to $15V_{DC}$	2A	400kHz	No	14 Lead PDIP 16 Lead PDIP Wafer, Die 16 Lead SOIC	Motor Control SMPS
HIP5500	N-Channel Half Bridge	$500V_{DC}$	$10V_{DC}$ to $15V_{DC}$	2.3A	300kHz	Yes	20 Lead PDIP 20 Lead SOIC	SMPS
SP600	N-Channel Half Bridge	$500V_{DC}$	$14.5V_{DC}$ to $16.5V_{DC}$	0.5A	20kHz	Yes	22 Lead PDIP	Motor Control
SP601	N-Channel Half Bridge	$500V_{DC}$	$14.5V_{DC}$ to $16.5V_{DC}$	0.5A	20kHz	Yes	22 Lead PDIP	Motor Control
HIGH SIDE DRIVERS THAT CAN BE USED IN HALF BRIDGE CONFIGURATION								
HV400	N-Channel Power Driver	$35V_{DC}$	$15V_{DC}$ to $30V_{DC}$	6A (ON) Source 30A(OFF) Sink	20kHz(MC) 200kHz (SMDS)	N/A	8 Lead PDIP 8 Lead SOIC	Motor Control SMPS
ICL7667	N-Channel Dual Driver	$15V_{DC}$	$4.5V_{DC}$ to $15V_{DC}$	1.5A	100kHz	No	TO-99, PDIP, CerDIP and SOIC	Motor Control SMPS, and MOS-FET Driver

HIGH SIDE PROTECTED POWER SWITCHES

TYPE	FUNCTION	MAX SUPPLY	DC SUPPLY RANGE	PEAK MAX CURRENT	DC MAX CURRENT	PACKAGE	RECOMMENDED APPLICATIONS
CA3273	Single Power	40V	4V to 24V	1.2A	0.6A	3 Lead Mod. TO-202	Solenoid, Relay, Lamp and Motor
HIP1030	Single Power	35V	4.5V to 25V	2.5A	1.1A	5 Lead TS-001AA	Solenoid, Relay, Lamp and Motor
HIP1031	Single Power	35V	4.5V to 25V	1.7A	0.7A	5 Lead TS-001AA	Solenoid, Relay, Lamp and Motor
HIP1090	Single Power	±90V, 15ms	4V to 16V	2A	1A	3 Lead TO-220	Solenoid, Relay, Lamp and Motor

HIGH SIDE MOSFET DRIVERS

TYPE	FUNCTION	MAX SUPPLY	DC SUPPLY RANGE	PEAK MAX CURRENT	MAX FREQUENCY	PACKAGE	RECOMMENDED APPLICATIONS
HV400	Single High Speed	35VDC	15V to 30V	6A (Source) 30A Sink (Pulsed)	20kHz (MC) 200kHz (SMPS)	8 Lead PDIP and SOIC	SMPS, FET Drivers, and Motor Controllers
ICL7667	Dual Power	15V	4.5V to 15V	1.5A (Pulsed Gate)	200kHz	8 Lead TO-99, PDIP, Cer-DIP, and SOIC	SMPS, FET Drivers, and Motor Controllers

AC TO DC CONVERTER

DEVICE	DESCRIPTION	AC INPUT VOLTAGE AT 50-60Hz AND 400Hz (VAC)	MAX DC SUPPLY VOLTAGE (V)	MAX OUTPUT CURRENT (mA)	SENSOR RANGE (RX) (KΩ)	FEATURES
CA3059	Zero Voltage Switch AC Power Control System on a Chip	24V 120V 208/230V 277V	14	124	2 to 100	Contains, Power Supply Zero Crossing Detector, External Sensor Comparator and Triac Driver. (Inhibit and Protection Circuits on CA3059 only)
CA3079			10	124	2 to 50	
HV-2405E	World Wide Single Chip Power Supply	15V to 275V	Output 5V to 24V	50		UL Recognized E130808
HIP5600	High Voltage Linear Regulator	50V to 280V	Output 1.2V to 350V	40		Thermal Protection

NOTE:

1. Electrical Characteristics at T_A = +25°C, 14 Lead Dual-In-Line (E) Package Operating Temperature Range (T_A) -55°C to +125°C.

FULL BRIDGES

PART NUMBER	DESCRIPTION	PEAK OUTPUT CURRENT EACH DRIVE	SUPPLY VOLTAGE BIAS/BUS	NO LOAD MAXIMUM SUPPLY CURRENT	TARGETED APPLICATIONS
CA3275	Dual Full Bridge Driver	150mA	8V to 16V	20mA	Instrumentation
HIP4020	Low Voltage Motor Drive Power Full Bridge Driver	0.5A	2.5V to 15V	5µA (Typ)	3V - 5V Motors
HIP4080	Full Bridge FET Driver With Comparator, High Performance	2.5A	Bias: 8V to 16V Bus: 1V to 80V	18mA	Class D Amplifier, Voice Coil, Motor Control
HIP4080A	Full Bridge FET Driver U/V, Comparator with Start-up Circuitry	2.5A	Bias: 9.5V to 16V Bus: 1V to 80V	18.5mA	Class D Amplifier, Voice Coil, Motor Control
HIP4081	Full Bridge FET Driver, High Performance, Independent FET Control	2.5A	Bias: 6V to 16V Bus: 1V to 80V	16mA	DC-DC Converters, Motor Control, UPS Class D Amplifier
HIP4081A	Full Bridge FET Driver With U/V, High Performance with Start-up Circuitry, Independent FET Control	2.5A	Bias: 9.5V to 16V Bus: 1V to 80V	16.5mA	DC-DC Converters, Motor Control, UPS Class D Amplifier
HIP4082	Full Bridge FET Driver With U/V, 20kHz-200kHz, Independent FET Control	1.25A	Bias: 9.5V to 16V Bus: 1V to 80V	6.5mA	UPS, Motor Control Class D Amplifier

POWER SUPPLY CIRCUITS

DEVICE	DESCRIPTION	INPUT VOLTAGE RANGE	OUTPUT VOLTAGE RANGE	MAXIMUM OUTPUT CURRENT	SWITCHING FREQUENCY	QUIESCENT CURRENT	TEMPERATURE RANGE
CA723	Linear Voltage Regulators	9.5V to 40V	2V to 37V	150mA		3.5mA	-55°C to +125°C
CA723C						4.0mA	0°C to +70°C
CA1523	Variable Internal Pulse Regulator for Switch Mode Power Supplies	11V to 15V	5.9V to 7.5V (Note 1)	50mA	≈ 200kHz	34mA	0°C to +70°C
CA1524	Pulse Width Modulators	8V to 40V	4.8V to 5.2V (Note 1)	100mA Max Rating for Each Output Driver	1kHz to 300kHz	10mA	-55°C to +125°C
CA2524			4.8V to 5.2V (Note 1)				0°C to +70°C
CA3524			4.6V to 5.4V (Note 1)				0°C to +70°C
CA3085	Linear Voltage Regulators	7.5V to 30V	1.8V to 26V	12mA to 100mA		4.5mA at V_{IN} = 30V	-55°C to +125°C
CA3085A		7.5V to 40V	1.7V to 36V	12mA to 100mA		5.0mA at V_{IN} = 40V	
CA3085B		7.5V to 50V	1.7V to 46V	12mA to 100mA		7.0mA at V_{IN} = 50V	
CA3277	Microprocessor Interface Controller Dual-Fixed 5V Regulator, Over-voltage Shutdown, Thermal Shut-down, Current Limited	6.2V to 18V	Output 1 - Full Time 5V ±0.25V Output 2 - Switched 5V ±0.25V	Output 1 - 100mA Output 2 - 100mA		500µA	-40°C to +85°C
HIP5061	7A Current Mode PWM Regulator - TO220 Type Package	10.8V Min 14V Zener	Determined by External Circuitry	Power DMOS Transistor 60V-7A	250kHz	25mA	0°C to +85°C Therm. Protect.
HIP5500	Half Bridge Power Supply Regulator	10V to 15V	500V Peak	2.3A Peak	30kHz to 300kHz	7mA	-40°C to +150°C
HIP5600	High Voltage Linear Regulator AC or DC Input	50V to 400V	1.2V to 350V	30mA		65µA	-40°C to +100°C Therm. Protect.
ICL7660SM	Super Voltage Converter (Charge Pump Type)	1.5V to 12V	-1.5V to ±22.8V	45mA	10kHz to 35kHz	200µA	-55°C to +125°C
ICL7660SI						180µA	-40°C to +85°C
ICL7660SC						180µA	0°C to +70°C
ICL7662M	Voltage Converter (Charge Pump Type)	4.5V to 20V	-4.5V to ±38.8V	90mA	10kHz	250µA	-55°C to +125°C
ICL7662C						200µA	0°C to +70°C
ICL7662I						200µA	-40°C to +85°C
ICL7663SA	Linear Voltage Regulators	1.6V to 16V	1.3V to 16V	40mA - V_{OUT2} R_{ON} - 100Ω - V_{OUT2}		10µA	-25°C to +85°C
ICL7663S						12µA	0°C to +70°C

VOLTAGE MONITORING CIRCUITS

DEVICE	DESCRIPTION	VOLTAGE RANGE	QUIESCENT CURRENT	OUTPUT CURRENT	INPUT TRIP VOLTAGE	TEMPERATURE RANGE
ICL7665SAI	CMOS Micropower Over/ Under Voltage Detector	1.8V to 16V	10µA	2mA	1.3 ±2%	-40°C to +85°C
ICL7665SAC					1.3 ±8%	0°C to +70°C
ICL7665SI					1.3 ±2%	-40°C to +85°C
ICL7665SC					1.3 ±8%	0°C to +70°C
ICL7673I	Automatic Battery Back-up Switch	2.5V to 15V	5µA	38mA	50mV (Note 2)	-25°C to +85°C
ICL7673C						0°C to +70°C
ICL8211M	Programmable Voltage Detectors	1.8V to 30V	350µA	3mA	1.15 + 3.5% 1.15 - 6.0%	-55°C to +125°C
ICL8211C						0°C to +70°C
ICL8212M				9mA	1.15 + 3.5% 1.15 - 13%	-55°C to +125°C
ICL8212C						0°C to +70°C

NOTES:

1. Reference Voltages - Output Voltage Limited by External Device
2. Primary to Back-up Source Voltage Differential

PROTECTION CIRCUITS

PART NUMBER	DESCRIPTION	SUPPLY VOLTAGE RANGE	OVER-VOLTAGE TURN-ON THRESHOLD	TEMPERATURE RANGE	PACKAGE
SP710	Protected Power Switch	4V to 16V	16V to 18.5V	-40°C to +105°C	3 Lead TO-220
SP720	Protection Array	4.5V to 30V	$+V_{BE}$ Above V_{CC} or $-V_{BE}$ Below GND	-40°C to +105°C	16 Lead Plastic DIP and SOIC
SP720MD-8	Ceramic Packaged Harris Class B "Equivalent" SP720 Parts with Back-End Conformance to MIL-STD-883	4.5V to 30V	$+V_{BE}$ Above V_{CC} or $-V_{BE}$ Below GND	-55°C to +125°C	16 Lead Ceramic SBDIP
SP720MM-8					20 Pad Ceramic LCC
SP720MD	High Reliability Ceramic Packaged SP720 Parts	4.5V to 30V	$+V_{BE}$ Above V_{CC} or $-V_{BE}$ Below GND	-55°C to +125°C	16 Lead Ceramic SBDIP
SP720MM					20 Pad Ceramic LCC
SP721	Protection Array	4.5V to 30V	$+V_{BE}$ Above V_{CC} or $-V_{BE}$ Below GND	-40°C to +105°C	8 Lead Plastic DIP and SOIC
HIP1090	Protected Power Switch	4V to 16V	16V to 19V	-40°C to +105°C	3 Lead TO-220

MULTIPLEX COMMUNICATION CIRCUITS

PART NUMBER	DESCRIPTION	APPLICATIONS	SUPPLY VOLTAGE	TEMPERATURE RANGE	PACKAGE
CDP68HC68S1	SPI Serial Bus Interface with Collision Detection and Arbitration	CCD 8/16-Bit Serial Bus	3V to 6V	-40°C to +105°C	14 Lead PDIP and 20 Lead SOIC
HIP7010	J1850 Byte Level Interface Circuit	J1850 Class B Variable Pulse Width (VPW)	3V to 6V	-40°C to +125°C	14 Lead PDIP and SOIC

MULTIPLEX COMMUNICATION CIRCUITS (Continued)

PART NUMBER	DESCRIPTION	APPLICATIONS	SUPPLY VOLTAGE	TEMPERATURE RANGE	PACKAGE
HIP7020	J1850 Bus Transceiver I/O for Multiplex Wiring	J1850 Class B Variable Pulse Width (VPW)	6V to 24V	-40°C to +125°C	8 Lead PDIP and 8 Lead SOIC
HIP7030A0	J1850 8-Bit 68HC05 Microcontroller Emulator Version	J1850 Class B Variable Pulse Width (VPW)	3V to 6V	-40°C to +125°C	68 Lead PLCC
HIP7030A2	J1850 8-Bit 68HC05 Microcontroller	J1850 Class B Variable Pulse Width (VPW)	3V to 6V	-40°C to +125°C	28 Lead PDIP and 28 Lead SOIC
HIP7038A8	J1850 8-Bit 68HC05 Microcontroller 8K EEPROM Version	J1850 Class B Variable Pulse Width (VPW)	5V	-40°C to +125°C	28 Lead Ceramic SOIC Flatpack

SPECIAL FUNCTION IC

PART NUMBER	DESCRIPTION	MAX SUPPLY VOLTAGE	MAX SUPPLY CURRENT	SENSOR/INPUT RANGE	I_{OUT} MAX	V_{OUT} MAX
CA3165E	Electronic Switching Circuits for Ignition and Proximity Sensing in General Purpose Control Circuits Using Q-Loaded Inductive Sensor (Multiple Outputs).	24V	18.4mA	Q-Loaded Self-Osc. Coil Pickup (~100µH)	120mA (Sink)	24V
CA3274	Power Switch with Current Limiting Feedback Control and Current Limiter Sense Flag. Used for Ignition and Current Controlled Switching Applications.	16V	25mA	0.4V to 2V Input Switching Thresholds (w/hysteresis)	200mA (Sink/ Source)	16V
HIP9010AB	Analog Signal Processing IC Suitable for Engine "Knock" Detection. Extensive Signal Processing is Achieved in the Frequency and Time Domain within the IC Via Microprocessor Control Through a "SPI" Interface Bus.	Intended to Operate From Same Power Supply as a Microcontroller with a Maximum V_{DD} of 7V and has a Maximum Supply Current of 12mA at 5V.		5mV to 8 V_{RMS} Input (from Piezoelectric Type Sensors). In the Application, the Useful Dynamic Signal Range is Less.	Output Signal, Pin 4 INOUT, is an Analog Voltage That Ranges From Approximately V_{DD} to 0.5V.	
HIP9020A, HIP9020AB	Vehicle Speed Sensor (VSS) Buffer ICs with Pre and Post Scaler Dividers for Processing Sinusoidal Waveforms from Magnetic Pickup Sensors with divide by 1, 6-11 Prescaling and 1, 2 Post Scaling Options (Multiple Outputs).	Shunt Regulator ~5.6V with Series Forward Diode/Resistor to Power Supply (V_{BATT}); or Use Ext. 5 ±0.3V Power Supply (Max I_{CC} = 12mA)		±(0.25 to 100)V with 40kΩ Ext. Series Current Limiting Resistor to Input	15mA (Sink)	24V
CA3020, CA3020A	Multipurpose Differential Power Amplifier and Switch Control Circuit.	3V to 12V	35mA	±100mV	240mA	18V/ 25V
CA3094, CA3094A, CA3094B	Multipurpose Differential Programmable Power Switch and Power Amplifier with 30MHz Unity Gain-BW.	To 44V	300mA	±100mV, (100dB Gain, Adj. with Operational Transconductance Amplifier Input)	To 300mA	To 44V

Intelligent Power Package Selection Guide

PART NUMBER	PACKAGE DESCRIPTION	PACKAGE OUTLINE
CA723E, CE	14 Lead Dual-In-Line Plastic Package	E14.3
CA723T, CT	10 Lead TO-100 Metal Can Package	T10.C
CA1523E	14 Lead Dual-In-Line Plastic Package	E14.3
CA1524E	16 Lead Dual-In-Line Plastic Package	E16.3
CA1524F	16 Lead Ceramic Dual-In-Line Frit Seal Package	F16.3
CA2524E	16 Lead Dual-In-Line Plastic Package	E16.3
CA2524F	16 Lead Ceramic Dual-In-Line Frit Seal Package	F16.3
CA3020, A	12 Lead TO-101 Metal Can Package	T12.B
CA3059	14 Lead Dual-In-Line Plastic Package	E14.3
CA3079	14 Lead Dual-In-Line Plastic Package	E14.3
CA3085, A, B	8 Lead TO-99 Metal Can Package	T8.C
CA3085E, AE, BE	8 Lead Dual-In-Line Plastic Package	E8.3
CA3094T	8 Lead TO-99 Metal Can Package	T8.C
CA3094E	8 Lead Dual-In-Line Plastic Package	E8.3
CA3094M	8 Lead Small Outline Plastic Package	M8.15
CA3165E	8 Lead Dual-In-Line Plastic Package	E8.3
CA3242E	16 Lead Dual-In-Line Plastic Package	E16.3
CA3262E, AE	16 Lead Dual-In-Line Plastic Package	E16.3
CA3262AQ	28 Lead Plastic Leaded Chip Carrier Package	N28.45
CA3272AQ	28 Lead Plastic Leaded Chip Carrier Package	N28.45
CA3273	3 Lead Single-In-Line Plastic Package	Z3.1A
CA3274E	8 Lead Dual-In-Line Plastic Package	E8.3
CA3275E	14 Lead Dual-In-Line Plastic Package	E14.3
CA3277E	16 Lead Dual-In-Line Plastic Package	E16.3
CA3282AS1	15 Lead Plastic Single-In-Line Package (Staggered Vertical Lead Form)	Z15.05A
CA3282AS2	15 Lead Plastic Single-In-Line Package (Surface Mount "Gullwing" Lead Form)	Z15.05B
CA3292AQ	28 Lead Plastic Leaded Chip Carrier Package	N28.45
CA3524E	16 Lead Dual-In-Line Plastic Package	E16.3
CA3524F	16 Lead Ceramic Dual-In-Line Frit Seal Package	F16.3
CDP68HC68S1E	14 Lead Dual-In-Line Plastic Package	E14.3
CDP68HC68S1M	20 Lead Small Outline Plastic Package	M20.3
HIP0080AM	28 Lead Plastic Leaded Chip Carrier Package	N28.45
HIP0081AS1	15 Lead Plastic Single-In-Line Package (Staggered Vertical Lead Form)	Z15.05A
HIP0081AS2	15 Lead Plastic Single-In-Line Package (Surface Mount "Gullwing" Lead Form)	Z15.05B
HIP0082AS1	15 Lead Plastic Single-In-Line Package (Staggered Vertical Lead Form)	Z15.05A

Package outlines and dimensions are available in Section 10.

PART NUMBER	PACKAGE DESCRIPTION	PACKAGE OUTLINE
HIP0082AS2	15 Lead Plastic Single-In-Line Package (Surface Mount "Gullwing" Lead Form)	Z15.05B
HIP1030AS	5 Lead Plastic Single-In-Line Package	Z5.067
HIP1031AS	5 Lead Plastic Single-In-Line Package	Z5.067
HIP1090AS	3 Lead Plastic Single-In-Line Package	Z3.1B
HIP2030IM	28 Lead Plastic Leaded Chip Carrier Package	N28.45
HIP2500IP	14 Lead Dual-In-Line Plastic Package	E14.3
HIP2500IPI	16 Lead Dual-In-Line Plastic Package	E16.3
HIP2500IB	16 Lead Small Outline Plastic Package	M16.3
HIP4020IB	20 Lead Small Outline Plastic Package	M20.3
HIP4080IP, AIP	20 Lead Dual-In-Line Plastic Package	E20.3
HIP4080IB, AIB	20 Lead Small Outline Plastic Package	M20.3
HIP4081IP, AIP	20 Lead Dual-In-Line Plastic Package	E20.3
HIP4081IB, AIB	20 Lead Small Outline Plastic Package	M20.3
HIP4082IP	16 Lead Dual-In-Line Plastic Package	E16.3
HIP4082IB	16 Lead Small Outline Plastic Package	M16.15
HIP5061DS	7 Lead Plastic Single-In-Line Package (Staggered Surface Mount "Gullwing" Lead Form)	Z7.05A
HIP5500IP	20 Lead Dual-In-Line Plastic Package	E20.3
HIP5500IB	20 Lead Small Outline Plastic Package	M20.3
HIP5600IS	3 Lead Plastic Single-In-Line Package	Z3.1B
HIP7010AP	14 Lead Dual-In-Line Plastic Package	E14.3
HIP7010AB	14 Lead Small Outline Plastic Package	M14.15
HIP7020AP	8 Lead Dual-In-Line Plastic Package	E8.3
HIP7020AB	8 Lead Small Outline Plastic Package	M8.15
HIP7030A0AM	68 Lead Plastic Leaded Chip Carrier Package	N68.95
HIP7030A2AP	28 Lead Dual-In-Line Plastic Package	E28.6
HIP7030A2AM	28 Lead Small Outline Plastic Package	M28.3
HIP7038A8IF	28 Lead Ceramic SOIC Flatpack Package	K28.E
HIP9010AB	20 Lead Small Outline Plastic Package	M20.3
HIP9020AP	14 Lead Dual-In-Line Plastic Package	E14.3
HIP9020AB	20 Lead Small Outline Plastic Package	M20.3
HV3-2405E-5, -9	8 Lead Dual-In-Line Plastic Package	E8.3
HV400IB	8 Lead Small Outline Plastic Package	M8.15
HV400IP	8 Lead Dual-In-Line Plastic Package	E8.3
HV400MJ/883	8 Lead Ceramic Dual-In-Line Metal Seal Package	D8.3
ICL7660CTV, MTV	8 Lead TO-99 Metal Can Package	T8.C
ICL7660CBA	8 Lead Small Outline Plastic Package	M8.15
ICL7660CPA	8 Lead Dual-In-Line Plastic Package	E8.3
ICL7660SCBA, IBA	8 Lead Small Outline Plastic Package	M8.15

Package outlines and dimensions are available in Section 10.

PART NUMBER	PACKAGE DESCRIPTION	PACKAGE OUTLINE
ICL7660SCPA, IPA	8 Lead Dual-In-Line Plastic Package	E8.3
ICL7660SCTV, ITV, MTV	8 Lead TO-99 Metal Can Package	T8.C
ICL7662CTV, MTV, ITV	8 Lead TO-99 Metal Can Package	T8.C
ICL7662CPA, IPA	8 Lead Dual-In-Line Plastic Package	E8.3
ICL7662CBD, CBD-O, IBD	14 Lead Small Outline Plastic Package	M14.15
ICL7663SCBA, IBA, ACBA, AIBA	8 Lead Small Outline Plastic Package	M8.15
ICL7663SCPA, IPA	8 Lead Dual-In-Line Plastic Package	E8.3
ICL7663SCJA, IJA	8 Lead Ceramic Dual-In-Line Frit Seal Package	F8.3A
ICL7663SACPA, AIPA	8 Lead Dual-In-Line Plastic Package	E8.3
ICL7663SACJA, AIJA	8 Lead Ceramic Dual-In-Line Frit Seal Package	F8.3A
ICL7665SCBA, IBA, ACBA, AIBA	8 Lead Small Outline Plastic Package	M8.15
ICL7665SCPA, IPA	8 Lead Dual-In-Line Plastic Package	E8.3
ICL7665SCJA, IJA	8 Lead Ceramic Dual-In-Line Frit Seal Package	F8.3A
ICL7665SACPA, AIPA	8 Lead Dual-In-Line Plastic Package	E8.3
ICL7665SACJA, AIJA	8 Lead Ceramic Dual-In-Line Frit Seal Package	F8.3A
ICL7667CBA	8 Lead Small Outline Plastic Package	M8.15
ICL7667CPA	8 Lead Dual-In-Line Plastic Package	E8.3
ICL7667CJA, MJA	8 Lead Ceramic Dual-In-Line Frit Seal Package	F8.3A
ICL7667CTV, MTV	8 Lead TO-99 Metal Can Package	T8.C
ICL7673CPA	8 Lead Dual-In-Line Plastic Package	E8.3
ICL7673CBA	8 Lead Small Outline Plastic Package	M8.15
ICL7673ITV	8 Lead TO-99 Metal Can Package	T8.C
ICL8211CPA	8 Lead Dual-In-Line Plastic Package	E8.3
ICL8211CBA	8 Lead Small Outline Plastic Package	M8.15
ICL8211CTY, MTY	8 Lead TO-99 Metal Can Package	T8.C
ICL8212CPA	8 Lead Dual-In-Line Plastic Package	E8.3
ICL8212CBA	8 Lead Small Outline Plastic Package	M8.15
ICL8212CTY, MTY	8 Lead TO-99 Metal Can Package	T8.C
SP600	22 Lead Dual-In-Line Plastic Package	E22.4
SP601	22 Lead Dual-In-Line Plastic Package	E22.4
SP710AS	3 Lead Plastic Single-In-Line Package	Z3.1B
SP720AP	16 Lead Dual-In-Line Plastic Package	E16.3
SP720AB	16 Lead Small Outline Plastic Package	M16.15
SP720MD	16 Lead Ceramic Dual-In-Line Metal Seal Package	D16.3
SP720MM	20 Pad Leadless Ceramic Chip Carrier Package	J20.A
SP721AP	8 Lead Dual-In-Line Plastic Package	E8.3
SP721AB	8 Lead Small Outline Plastic Package	M8.15

Package outlines and dimensions are available in Section 10.

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MOSFETs

ADVANCED POWER MOS

Features

- Current Limiting, Voltage Limiting and Current Sensing
- ESD Protection
- Logic Level
- Ultra High Speed (t < 5ns) Buffered FET

Applications

- Fault Tolerant Motor Drives
- Stall Protection
- Current Inrush Limiting
- Automotive Headlamp Drivers
- Diagnostic Motor Controls

JEDEC MOSFETs

Features

- JEDEC Registered MOSFETs for Military and High Rel Applications
- BV_{DSS} 60V to 500V
- N and P-Channel Devices
- Hermetic Packages

Applications

- Military
- High Reliability
- Space

LOGIC LEVEL MOSFETs

Features

- Full Drain Current Rating with 5V Gate Drive
- Microprocessor and Logic Compatible
- Electrostatic Discharge Protected Gates Available
- Avalanche Energy Capability Available
- Both N and P-Channel Devices
- BV_{DSS} Ratings of 50V to 200V
- Surface Mount D-Pak to TO-218/TO-247 Packages

Applications

- Direct Logic Control of 50A Loads
- No Static Drive Current Required on the Gate
- Solid State DC Relays
- Lamp Drivers
- Stepper Motor Drives
- Small Motor Controls
- High Side Drivers
- SMPS MOSFET Predrivers

STANDARD RFx, IRFx AND MegaFET MOSFETs N AND P-CHANNEL

Features

- Size 1 Through 6 Die Sizes
- All IRF Types Avalanche Capable
- BV_{DSS} up to 1000V
- MegaFETs Offer the Lowest $r_{DS(ON)}$

Applications

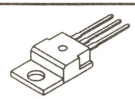
- Offline and DC/DC Converters
- Power Supplies
- Pulse Generators
- Super Efficient DC/DC Converters
- Solid State DC Relays
- Low Loss DC Switches
- Lamp Drivers
- Operational Amplifier Buffer Stage
- Stepper Motor Drives
- Small Motor Controls
- Laser Diode Pulse Generators
- SMPS Drivers

Advanced Power MOS Products

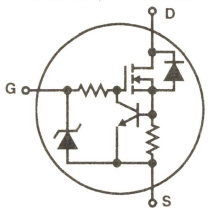
CURRENT LIMITING MOSFETs

Features

- Current Limits to a Pre-Set Level in a Shorted Load Condition
- "Logic-Level" Gate Input Allows Fully on Condition at 5V
- Monolithic Device Incorporates a Bipolar Transistor, 2 Resistors, a Zener Diode and a Power MOSFET
- ESD Protected to 2kV

MAXIMUM RATINGS				PACKAGE
BV_{DSS} (V)	$I_{DS(LIM)}$ (A)	$r_{DS\ (ON)}$ (Ω)	ESD (kV)	 TO-220AB
80	1	0.75	2	RLP1N08LE
80	5.5	0.12	2	RLP5N08LE

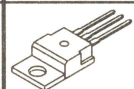
TERMINAL DIAGRAM



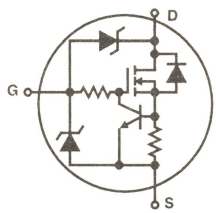
VOLTAGE CLAMPING, CURRENT LIMITING MOSFETs

Features

- Excessive Drain-Source Voltage Clamped by Active Region Turn-On, Clamp Voltage Level: 60V - 70V
- Current Limits to a Pre-Set Level in a Shorted Load Condition
- Monolithic Device Incorporates a Bipolar Transistor, 2 Resistors, 2 Zener Diodes and a Power MOSFET

MAXIMUM RATINGS				PACKAGE	
BV_{DSS} (V)	$I_{DS(LIM)}$ (A)	$r_{DS\ (ON)}$ (Ω)	ESD (kV)	 TO-220AB	TO-251AA
55	1	0.75	2	RLP1N06CLE	
55	0.3	5	2	RLP03N06CLE	RLD03N06CLE

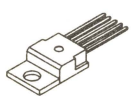
TERMINAL DIAGRAM



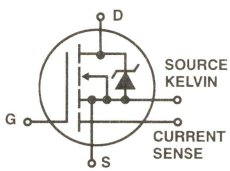
CURRENT SENSING MOSFETs

Features

- Built-In Current Sensing Function to be Used as a Feed-Back Signal for Control and/or Protection
- Low $r_{DS(ON)}$ = 0.1Ω max
- Current Sensing Ratio = 1500 ±10%
- Avalanche Energy Rated for Ruggedness

MAXIMUM RATINGS			PACKAGE
BV_{DSS} (V)	I_{DS} (A)	$r_{DS\ (ON)}$ (Ω)	 TS-001AA
100	18	0.10	RFB18N10CS

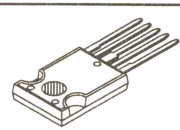
TERMINAL DIAGRAM



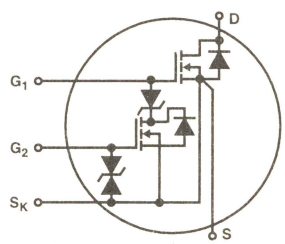
BUFFERED FET

Features

- Fall Time t_F < 5ns
- Similar Electrical Performance of an IRF450
- $r_{DS(ON)}$ 0.48Ω max
- Avalanche Rated to I_{DM} at +25°C and +150°C
- ESD Protected Gates -2KV

MAXIMUM RATINGS				PACKAGE
BV_{DSS} (V)	I_{DS} (A)	$r_{DS\ (ON)}$ (Ω)	t_F (ns)	 TO-247
500	10	0.48	5	RFV10N50BE

TERMINAL DIAGRAM



N-Channel Power MOSFET

RUGGED IRF SERIES

Features

- Single Pulse Avalanche Energy Rated
- SOA is Power Dissipation Limited
- Nanosecond Switching Speeds
- Linear Transfer Characteristics
- High Input Impedance
- Allows Reduced Protection Circuitry
- Reduced Drive Requirements
- Increased System Reliability

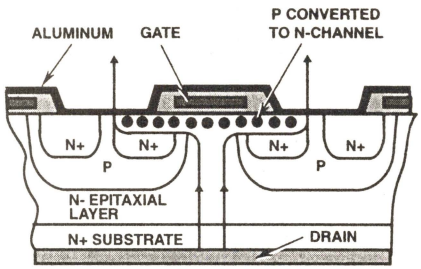
Description

The Rugged Series of Power MOSFETs are designed, tested, and guaranteed to withstand a specified level of circuit induced electrical stress in the breakdown avalanche mode of operation. These are n-channel enhancement mode polysilicon gate power field effect transistors designed for applications such as switching regulators, switching converters, motor and relay drivers, and drivers for high power bipolar switching transistors requiring high speed and low gate drive power.

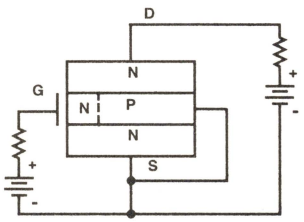
Using state-of-the-art integrated circuit processing techniques, these Rugged MOSFETs provide superior performance in inductive switching applications. The design is optimized to suppress the parasitic bipolar transistor and improve system reliability. These types can be driven directly from integrated circuits.

Rugged Series devices are identified by the suffix letter R following the type number or by the inclusion of a UIS SOA rating chart on the data sheet. This chart provides the user with a broad range of application usages for this capability. Application notes AN9321 and AN9322 detail this rating system.

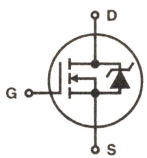
Cross Section of Chip Structure



Junction Diagram Showing Biasing Arrangements



Schematic Symbol



New MOSFET Products

N-CHANNEL MOSFETs

RLD03N06CLE, RLD03N06CLESM, RLP03N06CLE ESD RATED, LOGIC LEVEL N-CHANNEL MOSFETs

AnswerFAX DOCUMENT # 3948

- 0.30A, 60V
- $r_{DS(ON)} = 6.0\Omega$
- Built in Current Limit I_{LIMIT} 0.140 to 0.210A at 150°C
- Built in Voltage Clamp
- 2kV ESD Protected

RF1K49088 AVALANCHE RATED, LOGIC LEVEL, DUAL N-CHANNEL MOSFET

AnswerFAX DOCUMENT # 3952

- 3.5A, 30V
- $r_{DS(ON)} = 0.060\Omega$
- On-Resistance vs Gate Drive Voltage Curves
- Peak Current vs Pulse Width Curve
- UIS Rating Curve

RF1K49090 AVALANCHE RATED, LOGIC LEVEL, DUAL N-CHANNEL MOSFET

AnswerFAX DOCUMENT # 3985

- 3.5A, 12V
- $r_{DS(ON)} = 0.050\Omega$
- On-Resistance vs Gate Drive Voltage Curves
- Peak Current vs Pulse Width Curve
- UIS Rating Curve

RFP45N03L, RF1S45N03L, RF1S45N03LSM AVALANCHE RATED N-CHANNEL LOGIC LEVEL MOSFETs

AnswerFAX DOCUMENT # 4005

- 45A, 30V
- $r_{DS(ON)} = 0.022\Omega$
- Can be Driven Directly from CMOS, NMOS, and TTL Circuits
- Peak Current vs Pulse Width Curve
- UIS Rating Curve

RF1K49156 AVALANCHE RATED, LOGIC LEVEL, SINGLE N-CHANNEL MOSFET

AnswerFAX DOCUMENT # 4011

- 6.3A, 30V
- $r_{DS(ON)} = 0.030\Omega$
- On-Resistance vs Gate Drive Voltage Curves
- Peak Current vs Pulse Width Curve
- UIS Rating Curve

COMPLEMENTARY MOSFET

RF1K49092 AVALANCHE RATED, LOGIC LEVEL, COMPLEMENTARY ENHANCEMENT-MODE MOSFET

AnswerFAX DOCUMENT # 3968

- 3.5A, 12V (N-Channel)
  2.5A, 12V (P-Channel)
- $r_{DS(ON)} = 0.050\Omega$ (N-Channel)
  $r_{DS(ON)} = 0.130\Omega$ (P-Channel)
- *Temperature Compensating* PSPICE Model

P-CHANNEL MOSFETs

RF1K49093
AVALANCHE RATED, LOGIC LEVEL, DUAL
P-CHANNEL ENHANCEMENT-MODE MOSFET

AnswerFAX DOCUMENT # 3969

- 2.5A, 12V
- $r_{DS(ON)} = 0.130\Omega$
- *Temperature Compensating* PSPICE Model
- On-Resistance vs Gate Drive Voltage Curves
- Peak Current vs Pulse Width Curve
- UIS Rating Curve

IRFU9110, IRFR9110
AVALANCHE RATED, P-CHANNEL
ENHANCEMENT-MODE MOSFETs

AnswerFAX DOCUMENT # 4001

- 3.1A, 100V
- $r_{DS(ON)} = 1.200\Omega$
- *Temperature Compensating* PSPICE Model
- Peak Current vs Pulse Width Curve
- UIS Rating Curve

RFD15P06, RFD15P06SM, RFP15P06
AVALANCHE RATED, P-CHANNEL
ENHANCEMENT-MODE MOSFETs

AnswerFAX DOCUMENT # 3988

- 15A, 60V
- $r_{DS(ON)} = 0.150\Omega$
- *Temperature Compensating* PSPICE Model
- Peak Current vs Pulse Width Curve

RFF60P06
HERMETICALLY PACKAGED, AVALANCHE RATED
P-CHANNEL ENHANCEMENT-MODE MOSFET

AnswerFAX DOCUMENT # 3975

- 25A (Current is Limited by the Package Capability), 60V
- $r_{DS(ON)} = 0.030\Omega$
- *Temperature Compensating* PSPICE Model
- Peak Current vs Pulse Width Curve
- UIS Rating Curve
- +150°C Operating Temperature

RFG60P03, RFP60P03, RF1S60P03, RF1S60P03SM
AVALANCHE RATED, P-CHANNEL
ENHANCEMENT-MODE POWER MOSFETs

AnswerFAX DOCUMENT # 3951

- 60A, 30V
- $r_{DS(ON)} = 0.027\Omega$
- *Temperature Compensating* PSPICE Model
- Peak Current vs Pulse Width Curve
- UIS Rating Curve
- +175°C Operating Temperature

MOSFETs Ordering Information

R MOSFETs

1. R X X XX X XX XXX

FEATURE SUFFIX
- R: Rugged Capabilities Guaranteed
- L: Logic Level 5V Gate
- SM: Surface Mount Leadform (TO-252)
- E: ESD Protected Device
- CS: Current Sensing
- C: Voltage Clamping
- B: Integral Turn-Off Driver

VOLTAGE RATING/10
i.e. 05 = 50V, 10 = 100V, 20 = 200V, etc.

POLARITY
- N: N-Channel
- P: P-Channel

CURRENT RATING
1 = 1A, 10 = 10A, 25 = 25A, etc.

PACKAGE DESIGNATION
- A: MO-093AA
- B: TS-001
- D: TO-251, TO-252 (D-PAK)
- G: TO-247
- H: TO-218AC
- P: TO-220AB
- V: 5 Lead TO-247
- 1K: MS-012AA
- 1S: TO-262, TO-263

DEVICE TYPE
- F: Standard MOSFET
- L: Current Limited MOSFET

EXAMPLE: RLP1N08LE ESD Protected, Current Limited, TO-220, 1A, N-Channel, 80V Logic Level MOSFET

RFD15N05SM D-PAK, 15A, N-Channel, 50V, Surface Mount Leadform MOSFET

RFP12N06RLE TO-220, 12A N-Channel, 60V, Rugged, Logic Level, ESD Protected MOSFET

IRF MOSFETs

I R XX XXX X

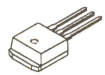
R: Ruggedized (Early Indicator for Avalanche Capability. All Devices now have EAS Ratings)

HEX DIE SIZE, Voltage Polarity and Electrical Selection

PACKAGE DESIGNATION:
- C: 5 Lead TO-220, Current Sensing
- FA: TO-204AA
- FD: 4 Lead DIP
- FF: TO-205AF (TO-39)
- FP: TO-247
- FR: TO-252
- FU: TO-251
- F1-F4: TO-204AA
- F5-F8: TO-220

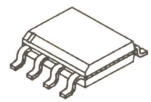
TO-263AB

TO-262AA

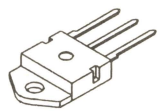


4-LEAD DIP

MS-012AA

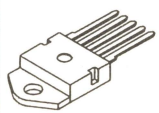


TO-218AC



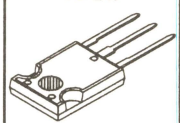
TO-251AA

MO-093AA

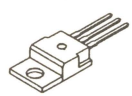


TO-252AA

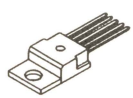
TO-247



TO-220AB



TS-001AA



MOSFETs Product Selection Trees

BUZ11
BUZ20
BUZ21
BUZ32
BUZ351
BUZ41A
BUZ42
BUZ60
BUZ60B
BUZ71
BUZ71A
BUZ72A
BUZ73A
BUZ76
BUZ76A
IR532
IRF510
IRF511
IRF512
IRF513
IRF520
IRF521
IRF522
IRF523
IRF530
IRF531
IRF533
IRF540
IRF541
IRF542
IRF543
IRF610
IRF611
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IRF624
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IRF627
IRF630
IRF631
IRF632
IRF633
IRF634
IRF635
IRF636

IRF637
IRF640
IRF641
IRF642
IRF643
IRF644
IRF645
IRF646
IRF647
IRF710
IRF711
IRF712
IRF713
IRF720
IRF721
IRF722
IRF723
IRF730
IRF731
IRF732
IRF733
IRF740
IRF741
IRF742
IRF743
IRF820
IRF821
IRF822
IRF823
IRF830
IRF831
IRF832
IRF833
IRF840
IRF843
IRFD110
IRFD111
IRFD112
IRFD113
IRFD120
IRFD121
IRFD122
IRFD123
IRFD1Z0
IRFD1Z1
IRFD1Z2
IRFD1Z3
IRFD210
IRFD211
IRFD212
IRFD213

IRFD220
IRFD221
IRFD222
IRFD223
IRFD2Z0
IRFD2Z1
IRFD2Z2
IRFD2Z3
IRFD310
IRFD311
IRFD312
IRFD313
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IRFR322
IRFR410
IRFR420
IRFR421
IRFR422
IRFU110
IRFU120
IRFU214
IRFU221
IRFU321
IRFU322
IRFU410
IRFU420
IRFU421
IRFU422
RF1K49086
RF1K49088
RF1K49157
RF1S45N06
RF1S45N06SM
RF1S50N06
RF1S50N06SM
RF1S70N03
RF1S70N03SM
RF1S70N05SM
RF1S70N06
RFA100N05E
RFD14N05
RFD14N05SM
RFD14N06
RFD14N06SM
RFD16N05
RFD16N05SM
RFD3055
RFD3055SM
RFG40N10
RFG45N06
RFG50N05
RFG50N06
RFG70N06
RFG75N05E
RFH10N45
RFH10N50
RFH12N35
RFH12N40

RFH25N18
RFH25N20
RFH30N12
RFH30N15
RFH35N08
RFH35N10
RFH45N05
RFH45N06
RFH75N05E
RFP10N12
RFP10N15
RFP12N08
RFP12N10
RFP12N18
RFP12N20
RFP14N05
RFP14N06
RFP15N05
RFP15N06
RFP15N12
RFP15N15
RFP18N08
RFP18N10
RFP22N10
RFP25N05
RFP25N06
RFP2N08
RFP2N08
RFP2N10
RFP2N12
RFP2N15
RFP2N18
RFP2N20
RFP3055
RFP3N45
RFP3N50
RFP40N10
RFP45N06
RFP4N05
RFP4N06
RFP4N100
RFP4N35
RFP4N40
RFP50N05
RFP50N06
RFP6N45
RFP6N50
RFP70N03
RFP70N06
RFP7N35
RFP7N40

P-CHANNEL MOSFETs

IRF9640
IRF9642
IRFD9110
IRFD9113
IRFD9120
IRFD9123
IRFD9220
IRFD9223
IRFP9140
IRFP9141
IRFP9142
IRFP9143
IRFP9150
IRFP9151
IRFP9240
IRFP9241
IRFP9242
IRFP9243
RF1S30P05
RF1S30P05SM
RF1S30P06
RF1S30P06SM
RF1S60P03
RF1S60P03SM
RF9630
RFF60P06
RFG30P06
RFG50P05
RFG50P05E
RFG60P03
RFG60P06E
RFH12P08
RFH25P10

JEDEC N-CHANNEL

2N6800
2N6794
2N6802
2N6755
2N6763
2N6756
2N6764
2N6792
2N6782
2N6788
2N6796
2N6784
2N6790
2N6798
2N6786
2N6757
2N6769
2N6762
2N6770
2N7224
2N7225
2N7227
2N7228
2N6761
2N6765
2N6758
2N6766
2N6768
2N6767
2N6760
2N6759

N-CHANNEL LOGIC LEVEL DEVICES

RF1K49090
RF1K49092
RF1K49156
RF1S45N03L
RF1S45N03LSM
RFG50N05L
RFP10N12L
RFP10N15L
RFP12N08L
RFP12N10L
RFP15N08L
RFP2N10L
RFP2N12L
RFP2N15L
RFP2N18L
RFP2N20L
RFP30N06LE
RFP7N10LE
RFP8N10L
RFP8N18L
RFW2N06RLE

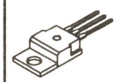
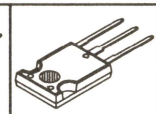
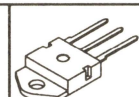
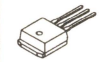
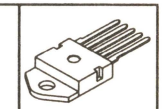
JEDEC P-CHANNEL

2N6895
2N6849
2N6851
2N6898
2N6804
2N6897
2N6896

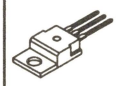
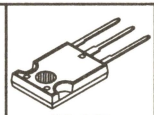
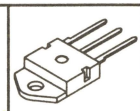
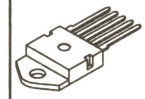
P-CHANNEL LOGIC LEVEL DEVICES

RF1K49093
RFD10P03L
RFD10P03LSM
RFP10P03L

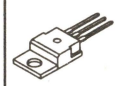
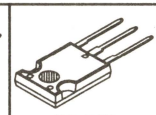
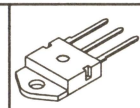
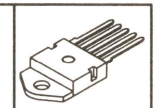
N-CHANNEL MOSFETS

MAXIMUM RATINGS												
												
BV_{DSS} (V)	I_D (A)	$r_{DS(ON)}$ (Ω)	TO-251AA	TO-252AA	TO-220AB	TO-247	4 PIN DIP	TO-218AC	TO-262AA	TO-263AB	MS-012AA	MO-093
30	3.5	2 x 0.06									RF1K49086	
30	6.3	0.03									RF1K49157	
30	70	0.010			RFP70N03				RF1S70N03	RF1S70N03SM		
50	4.0	0.800			RFP4N05							
50	13	0.120			BUZ71A							
50	14	0.100			BUZ71							
50	14	0.100	RFD14N05	RFD14N05SM	RFP14N05							
50	15	0.140			RFP15N05							
50	16	0.047	RFD16N05	RFD16N05SM								
50	25	0.047			RFP25N05							
50	30	0.040			BUZ11							
50	45	0.040						RFH45N05				
50	50	0.022			RFP50N05	RFG50N05						
50	75	0.008				RFG75N05E		RFH75N05E				
50	100	0.008										RFA100N05E
60	0.10	3.200					IRFD1Z3					
60	0.50	2.400					IRFD1Z1					
60	4.0	0.800			RFP4N06							
60	12	0.150	RFD3055	RFD3055SM	RFP3055							
60	14	0.100	RFD14N06	RFD14N06SM	RFP14N06							
60	15	0.140			RFP15N06							
60	25	0.047			RFP25N06							
60	34	0.080				IRFP153						
60	40	0.055				IRFP151						
60	45	0.028			RFP45N06	RFG45N06			RF1S45N06	RF1S45N06SM		
60	45	0.040						RFH45N06				

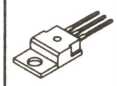
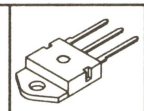
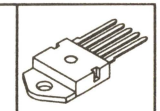
N-CHANNEL MOSFETS (Continued)

MAXIMUM RATINGS													
BV_{DSS} (V)	I_D (A)	$r_{DS(ON)}$ (Ω)	TO-251AA	TO-252AA	TO-220AB	TO-247	4 PIN DIP	TO-218AC	TO-262AA	TO-263AB	MS-012AA	MO-093	
60	50	0.022			RFP50N06	RFG50N06			RF1S50N06	RF1S50N06SM			
60	70	0.014			RFP70N06	RFG70N06			RF1S70N06	RF1S70N05SM			
80	0.80	0.800					IRFD113						
80	1.0	0.600					IRFD111						
80	1.0	0.400					IRFD123						
80	1.3	0.300					IRFD121						
80	2.0	1.050			RFP2N08			RFP2N08					
80	4.9	0.740						IRF513					
80	5.6	0.540						IRF511					
80	8.0	0.360						IRF523					
80	8.4	0.270		IRFR121	IRFU121								
80	9.2	0.270			IRF521								
80	12	0.200			RFP12N08								
80	12	0.230			IRF533								
80	14	0.160			IRF531								
80	18	0.100			RFP18N08								
80	25	0.100			IRF543								
80	27	0.099				IRFP143							
80	28	0.077			IRF541								
80	31	0.077				IRFP141							
80	35	0.055						RFH35N08					
100	0.40	3.200					IRFD1Z2						
100	0.50	2.400					IRFD1Z0						
100	0.80	0.800					IRFD112						
100	1.0	0.600					IRFD110						
100	1.1	0.400					IRFD122						
100	1.3	0.300					IRFD120						

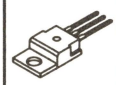
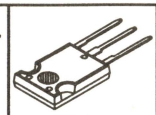
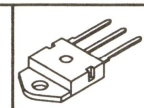
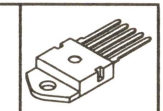
N-CHANNEL MOSFETS (Continued)

MAXIMUM RATINGS												
BV_{DSS} (V)	I_D (A)	$r_{DS(ON)}$ (Ω)	TO-251AA	TO-252AA	TO-220AB	TO-247	4 PIN DIP	TO-218AC	TO-262AA	TO-263AB	MS-012AA	MO-093
100	2.0	1.050			RFP2N10							
100	4.7	0.540	IRFU110	IRFR110								
100	4.9	0.740			IRF512							
100	5.6	0.540			IRF510							
100	8.0	0.360			IRF522							
100	8.4	0.270	IRFU120	IRFR120								
100	9.0	0.250			BUZ72A							
100	9.2	0.270			IRF520							
100	12	0.230			IRF532							
100	12	0.200			RFP12N10							
100	12	0.200			BUZ20							
100	14	0.160			IRF530							
100	18	0.100			RFP18N10							
100	19	0.100			BUZ21							
100	22	0.080			RFP22N10							
100	25	0.100			IRF542							
100	27	0.099				IRFP142						
100	28	0.077			IRF540							
100	31	0.077				IRFP140						
100	34	0.080				IRFP152						
100	35	0.055						RFH35N10				
100	40	0.040			RFP40N10	RFG40N10						
100	40	0.055				IRFP150						
120	2.0	1.750			RFP2N12							
120	10	0.300			RFP10N12							
120	15	0.150			RFP15N12							
120	30	0.075						RFH30N12				

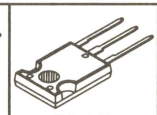
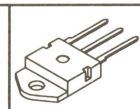
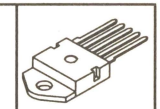
N-CHANNEL MOSFETS (Continued)

MAXIMUM RATINGS													
BV_{DSS} (V)	I_D (A)	$r_{DS(ON)}$ (Ω)	TO-251AA	TO-252AA	TO-220AB	TO-247	4 PIN DIP	TO-218AC	TO-262AA	TO-263AB	MS-012AA	MO-093	
150	0.30	6.500					IRFD2Z3						
150	0.32	5.000					IRFD2Z1						
150	0.45	2.400					IRFD213						
150	0.60	1.500					IRFD211						
150	0.70	1.200					IRFD223						
150	0.80	0.800					IRFD221						
150	2.0	1.750			RFP2N15								
150	2.6	2.400			IRF613								
150	3.3	1.500			IRF611								
150	4.0	1.200			IRF623								
150	4.6	0.800	IRFU221	IRFR221									
150	5.0	0.800			IRF621								
150	8.0	0.600			IRF633								
150	9.0	0.400			IRF631								
150	10	0.300			RFP10N15								
150	15	0.150			RFP15N15								
150	16	0.220			IRF643								
150	18	0.180			IRF641								
150	18	0.220				IRFP243							
150	20	0.180				IRFP241							
150	27	0.120				IRFP253							
150	30	0.075						RFH30N15					
150	33	0.085				IRFP251							
180	3.0	3.500			RFP2N18								
180	8.0	0.500			RFP8N18								
180	12	0.250			RFP12N18								
180	25	0.150						RFH25N18					

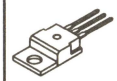
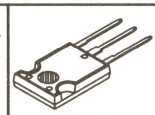
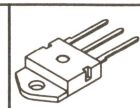
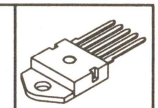
N-CHANNEL MOSFETS (Continued)

MAXIMUM RATINGS												
BV_{DSS} (V)	I_D (A)	$r_{DS(ON)}$ (Ω)	TO-251AA	TO-252AA	TO-220AB	TO-247	4 PIN DIP	TO-218AC	TO-262AA	TO-263AB	MS-012AA	MO-093
200	0.30	6.500					IRFD2Z2					
200	0.32	5.000					IRFD2Z0					
200	0.45	2.400					IRFD212					
200	0.60	1.500					IRFD210					
200	0.70	1.200					IRFD222					
200	0.80	0.800					IRFD220					
200	2.0	3.500			RFP2N20							
200	2.6	2.400			IRF612							
200	3.3	1.500			IRF610							
200	3.8	1.200	IRFU222	IRFR222								
200	4.0	1.200			IRF622							
200	4.6	0.800	IRFU220	IRFR220								
200	5.0	0.800			IRF620							
200	5.8	0.600			BUZ73A							
200	8.0	0.500			RFP8N20							
200	8.0	0.600			IRF632							
200	9.0	0.400			IRF630							
200	9.5	0.400			BUZ32							
200	12	0.250			RFP12N20							
200	16	0.220			IRF642							
200	18	0.180			IRF640							
200	18	0.220				IRFP242						
200	20	0.180				IRFP240						
200	25	0.150						RFH25N20				
200	27	0.120				IRFP252						
200	33	0.085				IRFP250						
250	2.0	2.000			IRF614							

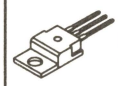
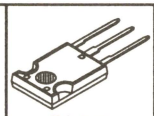
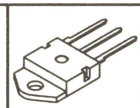
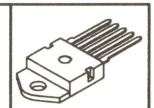
N-CHANNEL MOSFETS (Continued)

MAXIMUM RATINGS												
BV_{DSS} (V)	I_D (A)	$r_{DS(ON)}$ (Ω)	TO-251AA	TO-252AA	TO-220AB	 TO-247	4 PIN DIP	 TO-218AC	TO-262AA	TO-263AB	MS-012AA	 MO-093
250	2.2	2.000	IRFU214	IRFR214								
250	3.3	1.500			IRF625							
250	3.8	1.100			IRF624							
250	6.5	0.680			IRF635							
250	8.1	0.450			IRF634							
250	13	0.340			IRF645							
250	14	0.280			IRF644							
250	14	0.340				IRFP245						
250	15	0.280				IRFP244						
250	21	0.170				IRFP255						
250	23	0.140				IRFP254						
275	3.3	1.500			IRF627							
275	3.8	1.100			IRF626							
275	6.5	0.680			IRF637							
275	8.1	0.450			IRF636							
275	13	0.340			IRF647							
275	14	0.340				IRFP247						
275	14	0.280			IRF646							
275	15	0.280				IRFP246						
275	21	0.170				IRFP257						
275	23	0.140				IRFP256						
350	0.30	5.000					IRFD313					
350	0.40	2.500					IRFD323					
350	0.40	3.600					IRFD311					
350	0.50	1.800					IRFD321					
350	1.7	5.000			IRF713							
350	2.0	3.600			IRF711							

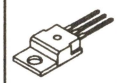
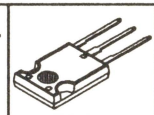
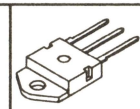
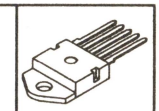
N-CHANNEL MOSFETS (Continued)

MAXIMUM RATINGS												
BV_{DSS} (V)	I_D (A)	$r_{DS(ON)}$ (Ω)	TO-251AA	TO-252AA	TO-220AB	TO-247	4 PIN DIP	TO-218AC	TO-262AA	TO-263AB	MS-012AA	MO-093
350	2.8	2.500			IRF723							
350	3.1	1.800	IRFU321	IRFR321								
350	3.3	1.800			IRF721							
350	4.0	2.000			RFP4N35							
350	4.5	1.500			IRF733							
350	5.5	1.000			IRF731							
350	7.0	0.750			RFP7N35							
350	8.0	0.800			IRF743							
350	8.7	0.800				IRFP343						
350	10	0.550			IRF741							
350	11	0.550				IRFP341						
350	12	0.380						RFH12N35				
350	14	0.400				IRFP353						
350	16	0.300				IRFP351						
400	0.30	5.000					IRFD312					
400	0.40	2.500					IRFD322					
400	0.40	3.600					IRFD310					
400	0.50	1.800					IRFD320					
400	1.7	5.000			IRF712							
400	2.0	3.600			IRF710							
400	2.6	2.500	IRFU322	IRFR322	BUZ76A							
400	2.8	2.500			IRF722							
400	3.0	1.800			BUZ76							
400	3.1	1.800	IRFU320	IRFR320								
400	3.3	1.800			IRF720							
400	4.0	2.000			RFP4N40							

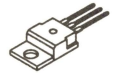
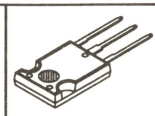
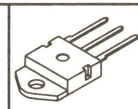
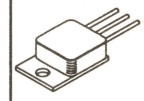
N-CHANNEL MOSFETS (Continued)

MAXIMUM RATINGS												
													
BV_{DSS} (V)	I_D (A)	$r_{DS(ON)}$ (Ω)	TO-251AA	TO-252AA	TO-220AB	TO-247	4 PIN DIP	TO-218AC	TO-262AA	TO-263AB	MS-012AA	MO-093
400	4.5	1.500			IRF732							
400	4.5	1.500			BUZ60B							
400	5.5	1.000			IRF730							
400	5.5	1.000			BUZ60							
400	7.0	0.750			RFP7N40							
400	8.0	0.800			IRF742							
400	8.7	0.800				IRFP342						
400	10	0.550			IRF740							
400	11	0.550				IRFP340						
400	11.5	0.400						BUZ351				
400	12	0.380						RFH12N40				
400	14	0.400				IRFP352						
400	16	0.300				IRFP350						
400	20	0.250				IRFP362						
400	23	0.200				IRFP360						
450	2.0	4.000			IRF823							
450	2.5	3.000	IRFU421	IRFR421	IRF821							
450	3.0	3.000			RFP3N45							
450	4.0	2.000			IRF833							
450	4.5	1.500			IRF831							
450	6.0	1.250			RFP6N45							
450	7.0	1.100			IRF843							
450	7.7	1.100				IRFP443						
450	8.0	0.850			IRF841							
450	8.8	0.850				IRFP441						
450	10	0.600						RFH10N45				
450	12	0.500				IRFP453						

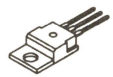
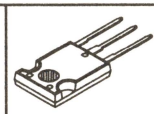
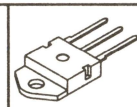
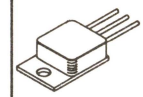
N-CHANNEL MOSFETS (Continued)

MAXIMUM RATINGS												
BV_{DSS} (V)	I_D (A)	$r_{DS(ON)}$ (Ω)	TO-251AA	TO-252AA	TO-220AB	TO-247	4 PIN DIP	TO-218AC	TO-262AA	TO-263AB	MS-012AA	MO-093
450	14	0.400				IRFP451						
500	1.5	7.000	IRFU410	IRFR410								
500	2.0	4.000			IRF822							
500	2.2	4.000	IRFU422	IRFR422								
500	2.5	3.000	IRFU420	IRFR420	IRF820							
500	3.0	3.000			RFP3N50							
500	4.0	2.000			BUZ42							
500	4.0	2.000			IRF832							
500	4.5	1.500			IRF830							
500	4.5	1.500			BUZ41A							
500	6.0	1.250			RFP6N50							
500	7.0	1.100			IRF842							
500	7.7	1.100				IRFP442						
500	8.0	0.850			IRF840							
500	8.8	0.850				IRFP440						
500	10	0.600						RFH10N50				
500	12	0.500				IRFP452						
500	14	0.400				IRFP450						
500	17	0.350				IRFP462						
500	20	0.270				IRFP460						
600	5.4	1.600			IRFBC42							
600	5.9	1.600				IRFPC42						
600	6.2	1.200			IRFBC40							
600	6.8	1.200				IRFPC40						
1000	3.9	4.200				IRFPG42						
1000	4.3	3.500			RFP4N100	IRFPG40						

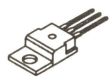
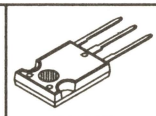
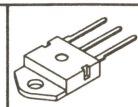
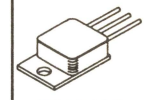
P-CHANNEL MOSFETS

MAXIMUM RATINGS											
											
BV_{DSS} (V)	I_D (A)	$r_{DS(ON)}$ (Ω)	TO-251AA	TO-252AA	TO-220AB	TO-247	4 PIN DIP	TO-218AC	TO-262AA	TO-263AB	TO-254AA
30	60	0.027			RFP60P03	RFG60P03			RF1S60P03	RF1S60P03SM	
50	8.0	0.300	RFD8P05	RFD8P05SM	RFP8P05						
50	15	0.150	RFD15P05	RFD15P05SM	RFP15P05						
50	30	0.065			RFP30P05	RFG50P05			RF1S30P05	RF1S30P05SM	
50	30	0.030				RFG50P05E					
60	0.60	1.600					IRFD9113				
60	0.80	0.800					IRFD9123				
60	2.5	1.600			IRF9513						
60	3.0	1.200			IRF9511						
60	5.0	0.800			IRF9523						
60	6.0	0.600			IRF9521						
60	8.0	0.300	RFD8P06E	RFD8P06ESM	RFP8P06E						
60	10	0.400			IRF9533						
60	12	0.300			IRF9531						
60	15	0.300			IRF9543						
60	15	0.150	RFD15P06	RFD15P06SM	RFP15P06						
60	16	0.300				IRFP9143					
60	19	0.200			IRF9541	IRFP9141					
60	25	0.150				IRFP9151					RFF60P06
60	30	0.065			RFP30P06	RFG30P06			RF1S30P06	RF1S30P06SM	
60	60	0.030				RFG60P06E					
80	2.0	3.500			RFP2P08						

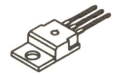
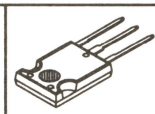
P-CHANNEL MOSFETS (Continued)

MAXIMUM RATINGS											
BV_{DSS} (V)	I_D (A)	$r_{DS(ON)}$ (Ω)	TO-251AA	TO-252AA	TO-220AB	TO-247	4 PIN DIP	TO-218AC	TO-262AA	TO-263AB	TO-254AA
80	6.0	0.600			RFP6P08						
80	8.0	0.400			RFP8P08						
80	12	0.300			RFP12P08						
80	25	0.150						RFH25P08			
100	0.70	1.200					IRFD9110				
100	1.0	0.600					IRFD9120				
100	2.0	3.500			RFP2P10						
100	2.5	1.600			IRF9512						
100	3.0	1.200			IRF9510						
100	3.1	1.200	IRFU9110	IRFR9110							
100	5.0	0.800			IRF9522						
100	5.6	0.600	IRFU9120	IRFR9120							
100	6.0	0.600			RFP6P10						
100	6.0	0.600			IRF9520						
100	8.0	0.400			RFP8P10						
100	10	0.400			IRF9532						
100	12	0.300			IRF9530						
100	12	0.300			RFP12P10						
100	15	0.300			IRF9542						
100	16	0.300				IRFP9142					
100	19	0.200			IRF9540	IRFP9140					
100	25	0.150				IRFP9150		RFH25P10			
120	5.0	1.000			RFP5P12						

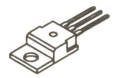
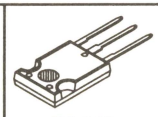
P-CHANNEL MOSFETS (Continued)

MAXIMUM RATINGS											
BV_{DSS} (V)	I_D (A)	$r_{DS(ON)}$ (Ω)	TO-251AA	TO-252AA	TO-220AB	TO-247	4 PIN DIP	TO-218AC	TO-262AA	TO-263AB	TO-254AA
120	10	0.500			RFP10P12						
150	0.45	2.400					IRFD9223				
150	3.0	2.400			IRF9623						
150	3.5	1.500			IRF9621						
150	5.0	1.000			RFP5P15						
150	5.5	1.200			IRF9633						
150	6.5	0.800			IRF9631						
150	9.0	0.700			IRF9643						
150	10	0.500			RFP10P15						
150	10	0.700				IRFP9243					
150	11	0.500			IRF9641						
150	12	0.500				IRFP9241					
200	0.60	1.500					IRFD9220				
200	3.0	2.400			IRF9622						
200	3.5	1.500			IRF9620						
200	5.5	1.200			IRF9632						
200	6.5	0.800			IRF9630						
200	9.0	0.700			IRF9642						
200	10	0.700				IRFP9242					
200	11	0.500			IRF9640						
200	12	0.500				IRFP9240					

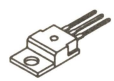
N-CHANNEL LOGIC LEVEL DEVICES

MAXIMUM RATINGS										
BV_{DSS} (V)	I_D (A)	$r_{DS(ON)}$ (Ω)	TO-251AA	TO-252AA	 TO-220AB	 TO-247	4 PIN DIP	TO-262AA	TO-263AB	MS-012AA
12	2.5/3.5	0.05/0.13 (COMP N&P)								RF1K49092
12	3.5	2 X 0.05								RF1K49090
30	3.5	2 X 0.06								RF1K49088
30	6.3	2 X 0.03								RF1K49156
30	16	0.022	RFD16N03L	RFD16N03LSM						
30	45	0.022			RFP45N03L			RF1S45N03L	RF1S45N03LSM	
50	4.0	0.800			RFP4N05L					
50	14	0.100	RFD14N05L	RFD14N05LSM	RFP14N05L					
50	15	0.140			RFP15N05L					
50	16	0.047	RFD16N05L	RFD16N05LSM						
50	25	0.047			RFP25N05L					
50	50	0.022			RFP50N05L	RFG50N05L				
60	2.0	0.160					RFW2N06RLE			
60	4.0	0.800	RFD4N06L	RFD4N06LSM	RFP4N06L					
60	12	0.135	RFD12N06RLE	RFD12N06RLESM	RFP12N06RLE					
60	12	0.15	RFD3055LE	RFD3055LESM	RFP3055LE					
60	15	0.140			RFP15N06L					
60	16	0.047	RFD16N06LE	RFD16N06LESM						
60	17	0.100			RFP17N06L					
60	25	0.085			RFP25N06L					
60	30	0.047			RFP30N06LE					
80	2.0	1.050			RFP2N08L					

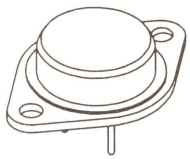
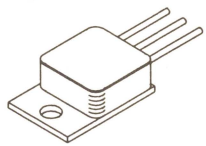
N-CHANNEL LOGIC LEVEL DEVICES (Continued)

MAXIMUM RATINGS										
BV_{DSS} (V)	I_D (A)	$r_{DS(ON)}$ (Ω)	TO-251AA	TO-252AA	TO-220AB	TO-247	4 PIN DIP	TO-262AA	TO-263AB	MS-012AA
80	3.0	0.800	RFD3N08L	RFD3N08LSM						
80	12	0.200			RFP12N08L					
80	15	0.140			RFP15N08L					
100	2.0	1.050			RFP2N10L					
100	7.0	0.300	RFD7N10LE	RFD7N10LESM	RFP7N10LE					
100	30	0.200			RFP12N10L					
120	2.0	1.750			RFP2N12L					
120	10	0.300			RFP10N12L					
150	2.0	1.750			RFP2N15L					
150	10	0.300			RFP10N15L					
180	2.0	3.500			RFP2N18L					
180	8.0	0.500			RFP8N18L					
200	2.0	3.500			RFP2N20L					
200	8.0	0.500			RFP8N10L					

P-CHANNEL LOGIC LEVEL DEVICES

MAXIMUM RATINGS						
BV_{DSS} (V)	I_D (A)	$r_{DS(ON)}$ (Ω)	TO-251AA	TO-252AA	TO-220AB	MS-012AA
12	3.5	2 x 0.13				RF1K49093
30	10	0.200	RFD10P03L	RFD10P03LSM	RFP10P03L	

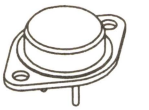
JEDEC N-CHANNEL

MAXIMUM RATINGS			PACKAGE		
					
BV_{DSS} (V)	I_{DS} (A)	$r_{DS(ON)}$ (Ω)	TO-205AF	TO-204	TO-254AA
60	12.0	0.25		2N6755	
60	31.0	0.08		2N6763	
100	3.5	0.6	2N6782 (Note 1)		
100	6.0	0.3	2N6788 (Note 1)		
100	8.0	0.18	2N6796 (Note 1)		
100	14.0	0.18		2N6756 (Note 1)	
100	34	0.07			2N7224 (Notes 1, 2)
100	38.0	0.055		2N6764 (Note 1)	
150	8.0	0.6		2N6757	
150	25.0	0.12		2N6765	
200	2.25	1.5	2N6784 (Note 1)		
200	3.5	0.8	2N6790 (Note 1)		
200	5.5	0.4	2N6798 (Note 1)		
200	9.0	0.4		2N6758 (Note 1)	
200	27.4	0.100			2N7225 (Notes 1, 2)
200	30.0	0.085		2N6766 (Note 1)	
350	4.5	1.5		2N6759	
350	12.0	0.4		2N6767	
400	1.25	3.6	2N6786 (Note 1)		
400	2.0	1.8	2N6792 (Note 1)		
400	3.0	1.0	2N6800 (Note 1)		
400	5.5	1.0		2N6760 (Note 1)	
400	14.0	0.315			2N7227 (Notes 1, 2)
400	14.0	0.3		2N6768 (Note 1)	
450	4.0	2.0		2N6761	
450	11.0	0.5		2N6769	
500	1.5	3.0	2N6794 (Note 1)		
500	3.5	1.5	2N6802 (Note 1)		
500	4.5	1.5		2N6762 (Note 1)	
500	12.0	0.415			2N7228 (Notes 1, 2)
500	12.0	0.4		2N6770 (Note 1)	

NOTES:

1. QPL - Approved Types
2. Available in JANTX and JANTXV Reliability Levels only.

JEDEC P-CHANNEL

MAXIMUM RATINGS			PACKAGE	
BV_{DSS} (V)	I_{DS} (A)	$r_{DS(ON)}$ (Ω)	TO-205AF	 TO-204
100	1.16	3.65	2N6895 (Note)	
100	6.0	0.6		2N6896 (Note)
100	6.5	0.3	2N6849 (Note)	
100	11.0	0.3		2N6804
100	12.0	0.3		2N6897 (Note)
100	25.0	0.2		2N6898 (Note)
200	4.0	0.8	2N6851 (Note)	

NOTE: QPL - Approved Types

POWER MOS AND MCT SPICE MODELS

Features

- Sub-Circuit Approach
- Full Operating Temperature Range
- Accurate Gate Charge Modelling
- BV_{DSS} Modelling at Low and High Currents
- Package Inductances
- Gate Series Resistance
- 3rd Quadrant Diode

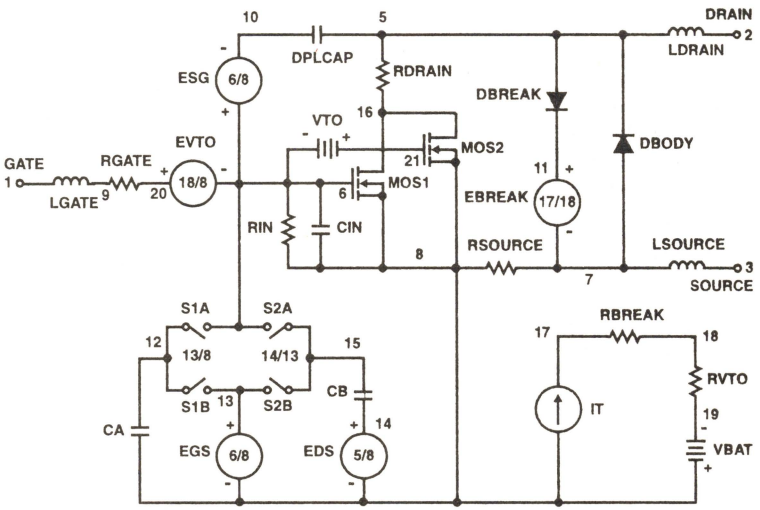


FIGURE 1. PSPICE MODEL SUBCIRCUIT

Disk and User's Guide Available (DB308)

MODELS AVAILABLE

FRK150	RF1K49156	RFD15P06, SM	RFG60P05E	RFP3055LE
FRK250	RF1K49157	RFD16N03L, SM	RFG60P06E	RFP30N06LE
FRK254	RF1S30P05, SM	RFD16N05, SM	RFG70N06	RFP30P05
FRL130	RF1S30P06, SM	RFD16N05L, SM	RFG75N05E	RFP30P06
FRL230	RF1S45N03L, SM	RFD16N06LE, SM	RFH75N05E	RFP45N03L
IRFR/U9110	RF1S45N06	RFD3055, SM	RFM15N06	RFP45N06
IRFR/U9120	RF1S50N06	RFD3055LE, SM	RFP10P03L	RFP50N06
IRFR/U9220	RF1S60P03, SM	RFD7N10LE, SM	RFP14N05	RFP60P03
MCTA75P60E1	RF1S70N03	RFD8P06E, SM	RFP14N06	RFP70N03
MCTV75P60E1	RF1S70N06	RFF60P06	RFP15N06	RFP70N06
RF1K49086	RFA100N05E	RFG30P05	RFP15P05	RFP7N10LE
RF1K49088	RFD10P03L, SM	RFG30P06	RFP15P06	RFP8P06E
RF1K49090	RFD14N05, SM	RFG45N06	RFP25N05	RLD03N06CLE, SM
RF1K49092N	RFD14N06, SM	RFG50N06	RFP25N06	RLP03N06CLE
RF1K49092P	RFD15P05, SM	RFG60P03	RFP3055	RLP1N08LE
RF1K49093				

INSULATED GATE BIPOLAR TRANSISTORS

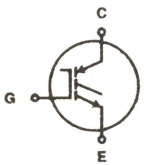
IGBTs FOR SWITCHING APPLICATIONS AND MOTOR CONTROL

Features

- Better Die Area Efficiency than MOSFETs in High Voltage Applications
- No Body Diode
- Gate Drive: Voltage Driven, Not Current
- On-State Voltage Drop not Temperature Dependent
- Surface Mount Packages

Applications

- Off Line SMPS
- High Voltage Motor Drives
- Synchronous Converters
- Deflection Circuits
- AC Switches



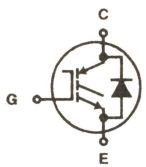
IGBTs WITH INTEGRAL REVERSE DIODE

Features

- Identical IGBT Specifications
- Ultra Fast Diode Added In Same Package
- 35ns to 100ns Recovery
- Soft Recovery Minimizes RFI
- Up to 1000V Breakdown

Applications

- Motor Drives
- Motor Brake
- SMPS



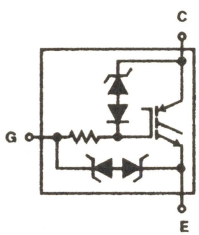
IGBTs WITH VOLTAGE CLAMPING

Features

- Collector-Gate Voltage Clamping
- ESD Protection
- Logic Level Gate

Applications

- Automotive Ignition Systems
- Power Solenoid Control
- Motor Control



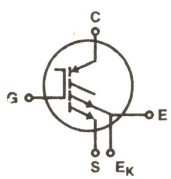
IGBTs WITH CURRENT SENSE

Features

- Sense Current Output a Ratio of Total Emitter Current
- Kelvin Contact To Minimize Control Loop Interface
- 5 Lead TO-218 and TO-220 Packages

Applications

- Feedback Motor Controls
- Current Sources
- Power Amplifiers

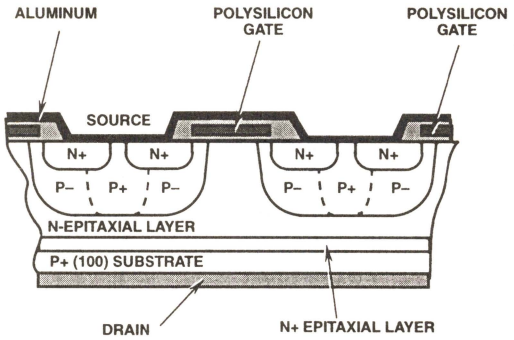


CHARACTERISTICS OF A POWER MOSFET AND A BIPOLAR TRANSISTOR

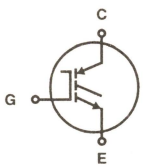
Features

- Voltage Gated
  - Requires Small Gate Power, Similar to Standard Power MOSFET
- Turn Off
  - Turns off When Gate Drive is Removed
- On-State Voltage Drop
  - Nonlinear, Temperature Independent, Unlike the Typical 2X Variation of a Power MOSFET
- Turn-On Speed
  - Fast! Comparable to a Standard Power MOSFET
- Turn-Off Speed
  - Comparable to a Bipolar Transistor

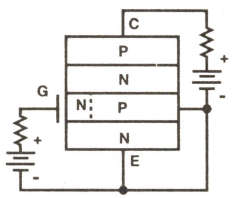
Cross Section of Chip Structure



Schematic Symbol



Junction Diagram Showing Biasing Arrangements

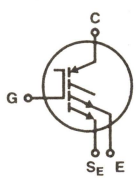


CURRENT SENSING IGBT

Features

- Built-in Current Sensing Function to be Used as a Feedback Signal for Control and/or Protection
- I_C at $T_J = 100^oC = 12A$, $BV_{CES} = 600V$, $V_{CE(ON)} = 2.7V$ Max at $I_{CE} = 10A$
- Sense Voltage at $I_{CE} = 10A$, $R_{SENSE} = 2K$, 1.4V to 1.8V

Terminal Diagram



IGBT Ordering Information

IGBTs

HGT - G - 12 - N - 60 - D - 1 - D

HARRIS IGBT

PACKAGE
- A: 5 Lead TO-218
- P: 3 Lead TO-220
- G: 3 Lead TO-247
- H: 3 Lead TO-218
- D: TO-251/TO-252 D-Pak
- V: 5 Lead TO-247

CONTINUOUS CURRENT
Rating at T_C = +90°C

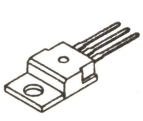
POLARITY
N-Channel or P-Channel

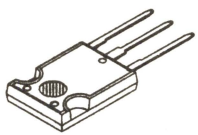
VOLTAGE BREAKDOWN/10
i.e. (40, 50, 60, 100, 120)

MAX FALL TIME AT T_J = +125°C
- A: 100ns
- B: 200ns
- C: 500ns
- D: 750ns
- E: 1μs
- F: 2μs
- G: 55μs

1: First Generation
2: Second Generation
3: Third Generation

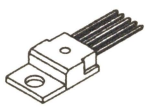
OPTIONS
- L: Logic Level Gate
- D: Integral Reverse Diode
- S: Surface Mount
- C: Current Sense
- V: Voltage Clamping

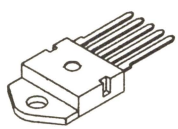

TO-220AB

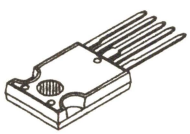

TO-247

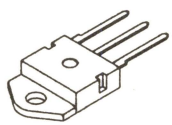
TO-251AA

TO-252AA

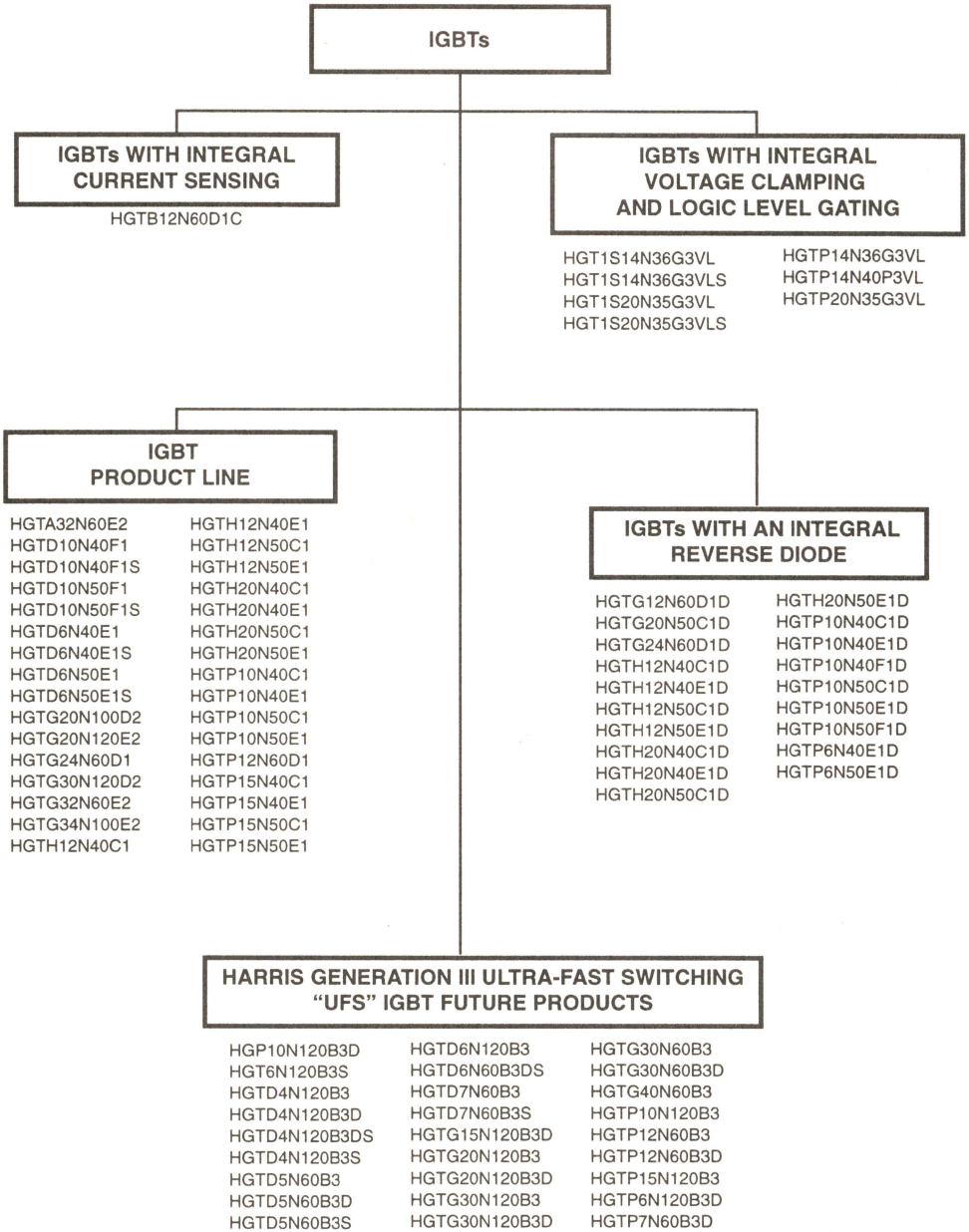

TS-001AA


MO-093AA

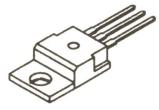
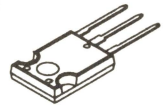
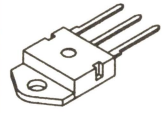
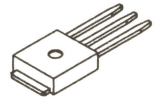
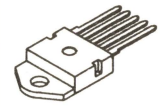

TO-247 5 LEAD


TO-218AC

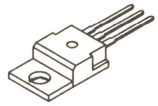
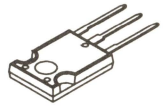
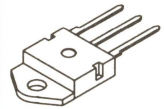
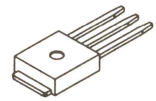
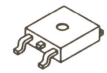
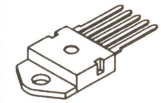
IGBT Product Selection Tree



HARRIS IGBT PRODUCT LINE

MAXIMUM RATINGS									
BV_{CES} (V)	I_{C90} (A)	I_{CM} (A)	t_F (μs)	 TO-220AB	 TO-247	 TO-218AC	 TO-251AA	TO-252AA	 MO-093AA
400	6	7.5	1.0				HGTD6N40E1	HGTD6N40E1S	
	10	12	1.2				HGTD10N40F1	HGTD10N40F1S	
	10	17.5	1.0	HGTP10N40E1					
			0.5	HGTP10N40C1					
	12	17.5	1.0			HGTH12N40E1			
			0.5			HGTH12N40C1			
	15	35	1.0	HGTP15N40E1					
			0.5	HGTP15N40C1					
	20	35	1.0			HGTH20N40E1			
			0.5			HGTH20N40C1			
500	5	10	1.0						
			0.5						
	6	7.5	1.0				HGTD6N50E1	HGTD6N50E1S	
	10	12	1.2				HGTD10N50F1	HGTD10N50F1S	
	10	17.5	1.0	HGTP10N50E1					
			0.5	HGTP10N50C1					
	12	17.5	1.0			HGTH12N50E1			
			0.5			HGTH12N50C1			
	15	35	1.0	HGTP15N50E1					
			0.5	HGTP15N50C1					
	20	35	1.0			HGTH20N50E1			
			0.5			HGTH20N50C1			
600	12	48	0.6	HGTP12N60D1					
	24	96	0.6		HGTG24N60D1				
	32	200	0.8		HGTG32N60E2				HGTA32N60E2

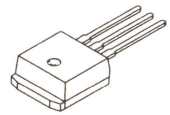
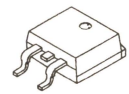
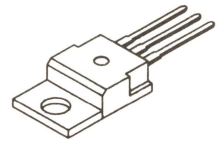
HARRIS IGBT PRODUCT LINE (Continued)

MAXIMUM RATINGS									
BV_{CES} (V)	I_{C90} (A)	I_{CM} (A)	t_F (μs)	 TO-220AB	 TO-247	 TO-218AC	 TO-251AA	 TO-252AA	 MO-093AA
1000	20	100	0.68		HGTG20N100D2				
	34	200	0.87		HGTG34N100E2				
1200	20	100	1.00		HGTG20N120E2				
	30	200	0.75		HGTG30N120D2				

NOTES:

1. I_{C90} = maximum continuous current rating at T_C = +90°C.
2. I_{CM} = maximum pulsed current rating.
3. t_F measured at T_C = +150°C.

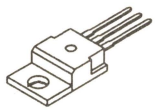
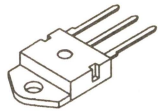
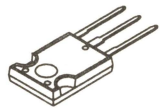
HARRIS IGBTs FEATURING LOGIC LEVEL DRIVE AND COLLECTOR-GATE VOLTAGE CLAMPING

MAXIMUM RATINGS								
BV_{CLAMP} (V)	I_{C100} (A)	$V_{CE(SAT)}$ (A)	R_G (Ω)	R_{GE} (Ω)	INDUCTIVE USE TEST (A)	 TO-262AA	 TO-263AB	 TO-220AB
350 - 420	14 at 90°C	2.0 at 10A, 4.5V	1K (Typ)	None	17 at L = 2.3mHy			HGTP14N40P3VL
320 - 390	20	1.6 at 10A, 4.5V	1K (Typ)	12K - 24K	26 at L = 2.3mHy	HGT1S20N35G3VL	HGT1S20N35G3VLS	HGTP20N35G3VL
330 - 390	14	1.45 at 7A, 4.5V	75 (Typ)	10K - 30K	17 at L = 2.3mHy	HGT1S14N36G3VL	HGT1S14N36G3VLS	HGTP14N36G3VL

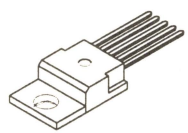
NOTES:

1. I_{C100} = maximum continuous current rating at T_C = +100°C.

HARRIS IGBTs WITH AN INTEGRAL REVERSE DIODE

MAXIMUM RATINGS						
BV_{CES} (V)	I_{C90} (A)	I_{CM} (A)	t_F (μs)	TO-220AB	TO-218AC	TO-247
400	6	7.5	1.0	HGTP6N40E1D		
	10	12	1.2	HGTP10N40F1D		
	10	17.5	1.0	HGTP10N40E1D		
			0.5	HGTP10N40C1D		
	12	17.5	1.0		HGTH12N40E1D	
			0.5		HGTH12N40C1D	
	20	35	1.0		HGTH20N40E1D	
			0.5		HGTH20N40C1D	
500	6	7.5	1.0	HGTP6N50E1D		
	10	12	1.2	HGTP10N50F1D		
	10	17.5	1.0	HGTP10N50E1D		
			0.5	HGTP10N50C1D		
	12	17.5	1.0		HGTH12N50E1D	
			0.5		HGTH12N50C1D	
	20	35	1.0		HGTH20N50E1D	
			0.5		HGTH20N50C1D	HGTG20N50C1D
600	12	48	0.6			HGTG12N60D1D
	24	96	0.6			HGTG24N60D1D

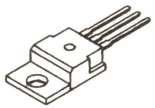
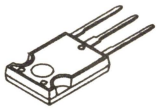
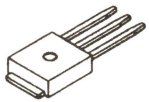
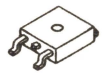
HARRIS IGBTs WITH INTEGRAL CURRENT SENSING

MAXIMUM RATINGS				
BV_{CES} (V)	I_{C90} (A)	I_{CM} (A)	t_F (μs)	TS-001AA (5 LEAD TO-220)
600	12	40	1.0	HGTB12N60D1C

NOTES:

1. I_{C90} = maximum continuous current rating at T_C = +90°C.
2. I_{CM} = maximum pulsed current rating.
3. t_F measured at T_C = +150°C.

HARRIS GENERATION III ULTRA-FAST SWITCHING "UFS" IGBT FUTURE PRODUCTS

BV_{CES} (V)	 TO-220AB	 TO-247	 TO-251AA	 TO-252AA
600	HGTP12N60B3	HGTG30N60B3	HGTD5N60B3	HGTD5N60B3S
		HGTG40N60B3	HGTD7N60B3	HGTD7N60B3S
1200	HGTP10N120B3	HGTG20N120B3	HGTD4N120B3	HGTD4N120B3S
	HGTP15N120B3	HGTG30N120B3	HGTD6N120B3	HGT6N120B3S
PRODUCTS WITH HYPERFAST ANTI-PARALLEL DIODES				
600	HGTP7N60B3D	HGTG30N60B3D	HGTD5N60B3D	HGTD6N60B3DS
	HGTP12N60B3D			
1200	HGTP6N120B3D	HGTG15N120B3D	HGTD4N120B3D	HGTD4N120B3DS
	HGP10N120B3D	HGTG20N120B3D		
		HGTG30N120B3D		

NOTES:

1. Collector Current Rating at T_J = +110°C.
2. Values for collector current may vary when final characterization is completed.
3. Collector current rating at 25°C is 2x T_J = 110°C rating.

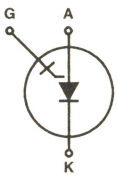
MOS CONTROLLED THYRISTOR

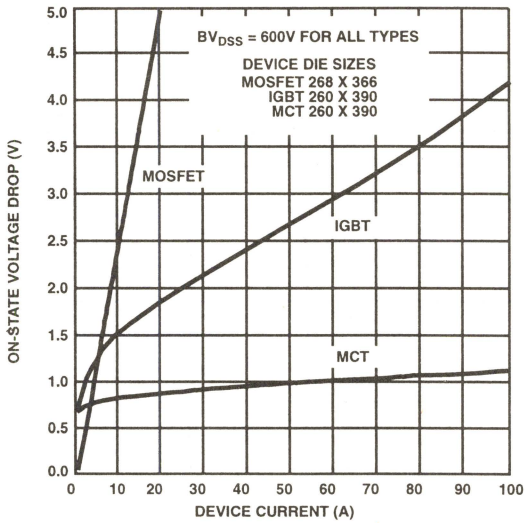
Features

- 2.3x Current Rating over MOSFETs, IGBTs, Bipolar
- Darlington Transistors
- Low Conduction Drop Typical 1.3V
- 2000A Surge Current Capability
- 2000A/µs di/dt Capability
- +150°C Operating Temperature

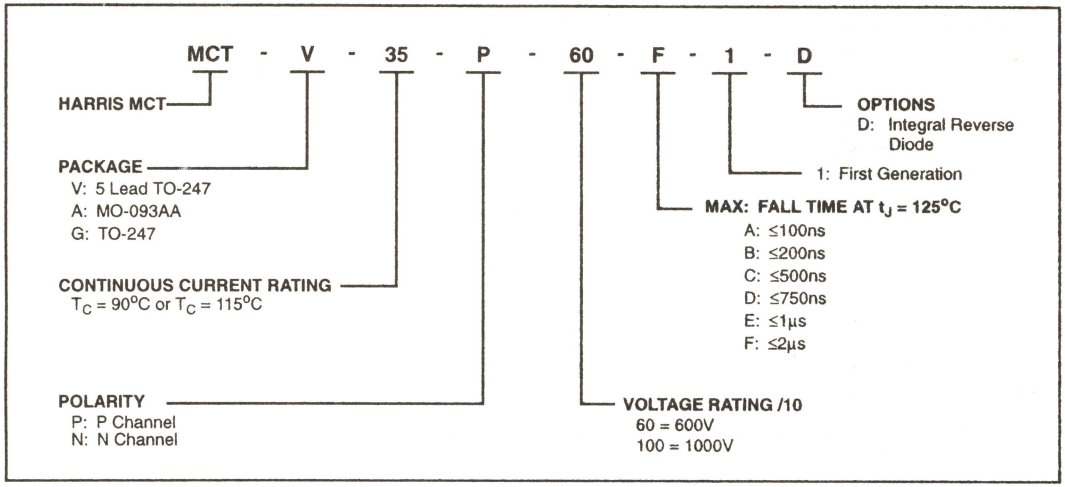
Applications

- Motor Control
- Inverters
- Resonant Power Systems
- Electric Vehicles



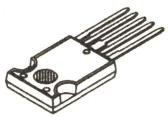
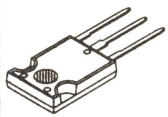
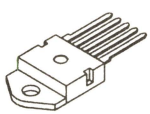
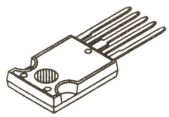


MCT Ordering Information



MCT Selection Guide

MOS CONTROLLED THYRISTOR PRODUCT MATRIX

							
	5 LEAD TO-247	TO-247	MO-093AA		5 LEAD TO-247		
	MCTV35P60F1D	MCTG35P60F1	MCTA75P60E1	MCTA65P100E1	MCTV75P60E1	MCTV75P100E1	UNITS
V_{DRM}	600	600	600	1000	600	1000	V
I_{K90}	35 (Note 1)	35 (Note 1)	75	65	75	65	A
I_{KM}	50	50	120	100	120	100	A
V_{TM} at I_{K90}	1.35 (Note 2)	1.35 (Note 2)	1.3	1.4	1.3	1.4	V
t_{FI}	1.4	1.4	1.4	1.9	1.4	1.9	µs
Diode V_F	1.4 (Note 2)	-	-	-	-	-	V
Diode t_{RR}	600	-	-	-	-	-	ns

NOTES:

1. I_{K115}; Continuous Cathode Current rated at $T_C = +115^oC$.
2. Measured at I_{K115}.

HARRIS RECTIFIER FAMILIES

Definitions

Rectifier

A rectifier allows current flow in one direction only. The difference between a Diode and a Rectifier is usually rated at a breakdown voltage of greater than 50V and has a power rating that is greater than 0.5W.

HYPER FAST AND ULTRA FAST RECOVERY RECTIFIERS

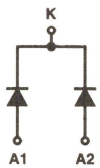
Features

- 25ns to 150ns Reverse Recovery Time
- Reverse Voltage Range Between 50V to 1200V
- Current Peak (I_{FSM}) Handling Capability up to 325A
- Single or Dual Rectifier Style Available
- Various Package Styles Including Axial and Radial Types of Devices

Applications

- Power Supplies in the 100kHz - 500kHz Switching Range

SINGLE



DUAL

NOTE: A = Anode, K = Cathode

New Rectifier Products

RHRD6120, RHRD6120S
6A, 1200V HYPERFAST DIODE

AnswerFAX DOCUMENT # 3981

- Hyperfast with Soft Recovery . . . . . <55ns
- Operating Temperature . . . . . +175°C
- **Reverse Voltage. 1200V**

RHRP3040, RHRP3050, RHRP3060
30A, 400V - 600V HYPERFAST DIODE

AnswerFAX DOCUMENT # 3933

- Hyperfast with Soft Recovery . . . . . <40ns
- Operating Temperature. . . . . +175°C
- Reverse Voltage Up To. 600V

RURD6120, RURD6120S
6A, 1200V ULTRAFAST DIODES

AnswerFAX DOCUMENT # 3962

- Ultrafast with Soft Recovery . . . . . <70ns
- Operating Temperature . . . . . +175°C
- Reverse Voltage 1200V

RHRG3040CC, RHRG3050CC, RHRG3060CC
30A, 400V - 600V HYPERFAST DUAL DIODES

AnswerFAX DOCUMENT # 3939

- Hyperfast with Soft Recovery . . . . . <40ns
- Operating Temperature. . . . . +175°C
- Reverse Voltage Up To. 600V

RHRP840CC, RHRP850CC, RHRP860CC
8A, 400V - 600V HYPERFAST DUAL DIODES

AnswerFAX DOCUMENT # 3964

- Hyperfast with Soft Recovery . . . . . <30ns
- Operating Temperature . . . . . +175°C
- Reverse Voltage Up To 600V

RHRP3070, RHRP3080, RHRP3090, RHRP30100
30A, 700V - 1000V HYPERFAST DIODES

AnswerFAX DOCUMENT # 3940

- Hyperfast with Soft Recovery . . . . . <65ns
- Operating Temperature. . . . . +175°C
- Reverse Voltage Up To. 1000V

RHRP870CC, RHRP880CC, RHRP890CC,
RHRP8100CC
8A, 700V - 1000V HYPERFAST DUAL DIODES

AnswerFAX DOCUMENT # 3965

- Hyperfast with Soft Recovery . . . . . <55ns
- Operating Temperature . . . . . +175°C
- Reverse Voltage Up To 1000V

RHRG3070, RHRG3080, RHRG3090,
RHRG30100
30A, 700V - 1000V HYPERFAST DIODES

AnswerFAX DOCUMENT # 3941

- Hyperfast with Soft Recovery . . . . . <65ns
- Operating Temperature. . . . . +175°C
- Reverse Voltage Up To. 1000V

RHRP8120CC
8A, 1200V HYPERFAST
DUAL DIODE

AnswerFAX DOCUMENT # 3966

- Hyperfast with Soft Recovery . . . . . <55ns
- Operating Temperature . . . . . +175°C
- Reverse Voltage 1200V

RHRG3070CC, RHRG3080CC, RHRG3090CC,
RHRG30100CC
30A, 700V - 1000V HYPERFAST DIODES

AnswerFAX DOCUMENT # 3942

- Hyperfast with Soft Recovery . . . . . <65ns
- Operating Temperature. . . . . +175°C
- Reverse Voltage Up To. 1000V

RHRU50120
50A, 1200V HYPERFAST DIODE

AnswerFAX DOCUMENT # 3946

- Hyperfast with Soft Recovery. . . . . <85ns
- Operating Temperature . . . . . +175°C
- Reverse Voltage. 1200V

RHRG7540, RHRG7550, RHRG7560
75A, 400V - 600V HYPERFAST DIODES

AnswerFAX DOCUMENT # 3944

- Hyperfast with Soft Recovery . . . . . <55ns
- Operating Temperature . . . . . +175°C
- Reverse Voltage Up To 600V

RHRG50120
50A, 1200V HYPERFAST DIODE

AnswerFAX DOCUMENT # 3947

- Hyperfast with Soft Recovery. . . . . <85ns
- Operating Temperature . . . . . +175°C
- Reverse Voltage. 1200V

RHRU7540, RHRU7550, RHRU7560
75A, 400V - 600V HYPERFAST DIODES

AnswerFAX DOCUMENT # 3945

- Hyperfast with Soft Recovery . . . . . <55ns
- Operating Temperature . . . . . +175°C
- Reverse Voltage Up To 600V

Rectifier Ordering Information

RECTIFIERS

ULTRAFAST AND HYPERFAST REVERSE RECOVERY DIODES

XXX X XX XXX XX

FAST RECOVERY DIODE
RUR: Ultrafast
RHR: Hyperfast

PACKAGE
P: 2 and 3 Lead TO-220
G: 2 and 3 Lead TO-247
H: 2 and 3 Lead TO-218
M: TO-204AA
D: 2 and 3 Lead TO-251/TO-252
U: 1 Lead TO-218

CONTINUOUS CURRENT RATING

PEAK REPETITIVE REVERSE VOLTAGE DIVIDED BY TEN

OPTIONS
CC: Common Cathode
S: Surface Mount

MUR XX XX PT/CT

CURRENT RATING
i.e. 8 = 8A
30 = 30A

VOLTAGE RATING/10
i.e. 20 = 200V
120 = 1200V

DESIGNATES DUAL - COMMON CATHODE PART
CT: TO-220
PT: TO-247

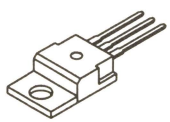
BYW51 XXX

VOLTAGE RATING
100 = 100V
200 = 200V

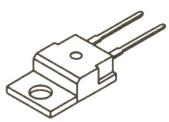
PACKAGE STYLES

HARRIS RECTIFIER PREFIXES BYW, MUR, RUR, RHR

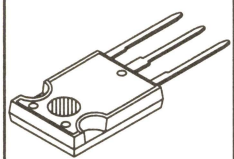
TO-220AB



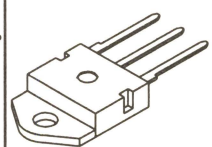
TO-220AC



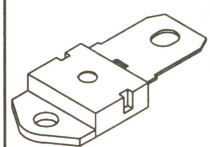
TO-247



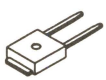
TO-218AC



TO-218 (Single Lead)



TO-251 (Two Lead)



TO-251AA

TO-252 (Two Lead)

Rectifier Product Selection Tree

RECTIFIER PRODUCT LINE

ULTRA-FAST RECOVERY

MUR1510
MUR1515
MUR1520
MUR1540
MUR1550
MUR1560
MUR810
MUR8100E
MUR815
MUR820
MUR840
MUR850
MUR860
MUR870E
MUR880E
MUR890E
RURD410
RURD410S
RURD4120
RURD4120S
RURD415
RURD415S
RURD420
RURD420S
RURD440
RURD440S
RURD450
RURD450S
RURD460
RURD460S
RURD610
RURD610S
RURD6120
RURD6120S
RURD615
RURD615S
RURD620
RURD620S
RURD640
RURD640S
RURD650
RURD650S
RURD660
RURD660S
RURG3010
RURG30100
RURG30120
RURG3015
RURG3020
RURG3040
RURG3050
RURG3060
RURG3070
RURG3080
RURG3090
RURG50100
RURG50120
RURG5040
RURG5050
RURG5060
RURG5070
RURG5080
RURG5090
RURG75120
RURG80100
RURG8040
RURG8050
RURG8060
RURG8070
RURG8080
RURG8090
RURP1510
RURP15100
RURP15120
RURP1515
RURP1520
RURP1540
RURP1550
RURP1560
RURP1570
RURP1580
RURP1590
RURP3010
RURP30100
RURP30120
RURP3015
RURP3020
RURP3040
RURP3050
RURP3060
RURP3070
RURP3080
RURP3090
RURP810
RURP8100
RURP8120
RURP815
RURP820
RURP840
RURP850
RURP860
RURP870
RURP880
RURP890
RURU100100
RURU100120
RURU10040
RURU10050
RURU10060
RURU10070
RURU10080
RURU10090
RURU150100
RURU150120
RURU15040
RURU15050
RURU15060
RURU15070
RURU15080
RURU15090
RURU50100
RURU50120
RURU5040
RURU5050
RURU5060
RURU5070
RURU5080
RURU5090
RURU75120
RURU80100
RURU8040
RURU8050
RURU8060
RURU8070
RURU8080
RURU8090

DUAL ULTRA-FAST RECOVERY

BYW51100
BYW51150
BYW51200
MUR1610CT
MUR1615CT
MUR1620CT
MUR3010PT
MUR3015PT
MUR3020PT
MUR3040PT
MUR3050PT
MUR3060PT
RURD410CC
RURD410CCS
RURD415CC
RURD415CCS
RURD420CC
RURD420CCS
RURD440CC
RURD440CCS
RURD4460CCS
RURD450CC
RURD450CCS
RURD460CC
RURD610CC
RURD610CCS
RURD615CC
RURD615CCS
RURD620CC
RURD620CCS
RURD640CC
RURD650CC
RURD660CC
RURG15100CC
RURG1510CC
RURG15120CC
RURG1515CC
RURG1520CC
RURG1540CC
RURG1550CC
RURG1560CC
RURG1570CC
RURG1580CC
RURG1590CC
RURG30100CC
RURG3010CC
RURG30120CC
RURG3015CC
RURG3020CC
RURG3040CC
RURG3050CC
RURG3060CC
RURG3070CC
RURG3080CC
RURG3090CC
RURH15100CC
RURH1510CC
RURH1515CC
RURH1520CC
RURH1540CC
RURH1550CC
RURH1560CC
RURH1570CC
RURH1580CC
RURH1590CC
RURH30100CC
RURH3010CC
RURH3015CC
RURH3020CC
RURH3040CC
RURH3050CC
RURH3060CC
RURH3070CC
RURH3080CC
RURH3090CC
RURP4120CCS
RURP6120CCS
RURP640CC
RURP650CC
RURP660CC
RURP8100CC
RURP810CC
RURP8120CC
RURP815CC
RURP820CC
RURP840CC
RURP850CC
RURP860CC
RURP870CC
RURP880CC
RURP890CC

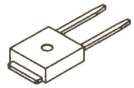
HYPER-FAST RECOVERY

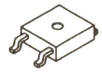
RHRD4120
RHRD4120S
RHRD440
RHRD440S
RHRD450
RHRD450S
RHRD460
RHRD460S
RHRD6120
RHRD6120S
RHRD640
RHRD640S
RHRD650
RHRD650S
RHRD660
RHRD660S
RHRG30100
RHRG30120
RHRG3040
RHRG3050
RHRG3060
RHRG3070
RHRG3080
RHRG3090
RHRG50100
RHRG50120
RHRG5040
RHRG5050
RHRG5060
RHRG5070
RHRG5080
RHRG5090
RHRG75100
RHRG75120
RHRG7540
RHRG7550
RHRG7560
RHRG7570
RHRG7580
RHRG7590
RHRP15100
RHRP15120
RHRP1540
RHRP1550
RHRP1560
RHRP1570
RHRP1580
RHRP1590
RHRP30100
RHRP30120
RHRP3040
RHRP3050
RHRP3060
RHRP3070
RHRP3080
RHRP3090
RHRP8100
RHRP8120
RHRP840
RHRP850
RHRP860
RHRP870
RHRP880
RHRP890
RHRU100120
RHRU10040
RHRU10050
RHRU10060
RHRU150100
RHRU150120
RHRU15040
RHRU15050
RHRU15060
RHRU50100
RHRU50120
RHRU5040
RHRU5050
RHRU5060
RHRU5070
RHRU5080
RHRU5090
RHRU75100
RHRU75120
RHRU7540
RHRU7550
RHRU7560
RHRU7570
RHRU7580
RHRU7590

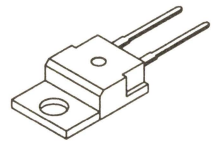
DUAL HYPER-FAST RECOVERY

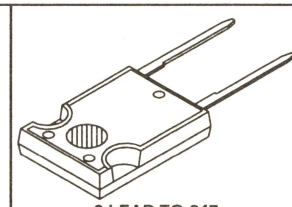
RHRD440CC
RHRD440CCS
RHRD450CC
RHRD450CCS
RHRD460CC
RHRD460CCS
RHRD640CC
RHRD650CC
RHRD660CC
RHRG15100CC
RHRG15120CC
RHRG1540CC
RHRG1550CC
RHRG1560CC
RHRG1570CC
RHRG1580CC
RHRG1590CC
RHRG30100CC
RHRG30120CC
RHRG3040CC
RHRG3050CC
RHRG3060CC
RHRG3070CC
RHRG3080CC
RHRG3090CC
RHRP4120CC
RHRP6120CC
RHRP640CC
RHRP650CC
RHRP660CC
RHRP8100CC
RHRP8120CC
RHRP840CC
RHRP850CC
RHRP860CC
RHRP870CC
RHRP880CC
RHRP890CC

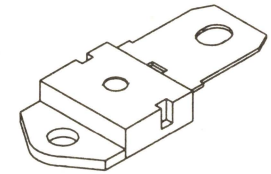
HARRIS ULTRA-FAST RECOVERY RECTIFIER PRODUCT LINE







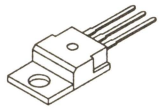


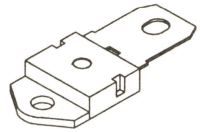


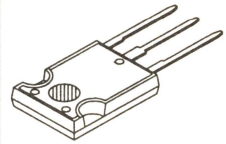
	TO-251		TO-252		TO-220AC			2 LEAD TO-247			SINGLE LEAD TO-218			
	$I_{F(AVG)}$		$I_{F(AVG)}$		$I_{F(AVG)}$			$I_{F(AVG)}$			$I_{F(AVG)}$			
V_{RRM}	4A	6A	4A	6A	8A	15A	30A	30A	50A	75A/80A	50A	75A/80A	100A	150A
100V	RURD410 1.0V 35ns	RURD610 1.0V 35ns	RURD410S 1.0V 35ns	RURD610S 1.0V 35ns	MUR810 RURP810 0.975V 35ns†	MUR1510 RURP1510 1.05V 35ns	RURP3010 1.0V 50ns	RURG3010 1.0V 50ns						
150V	RURD415 1.0V 35ns	RURD615 1.0V 35ns	RURD415S 1.0V 35ns	RURD615S 1.0V 35ns	MUR815 RURP815 0.975V 35ns†	MUR1515 RURP1515 1.05V 35ns	RURP3015 1.0V 50ns	RURG3015 1.0V 50ns						
200V	RURD420 1.0V 35ns	RURD620 1.0V 35ns	RURD420S 1.0V 35ns	RURD620S 1.0V 35ns	MUR820 RURP820 1.0V 35ns†	MUR1520 RURP1520 1.05V 35ns	RURP3020 1.0V 50ns	RURG3020 1.0V 50ns						
400V	RURD440 1.5V 60ns	RURD640 1.5V 60ns	RURD440S 1.5V 60ns	RURD640S 1.5V 60ns	MUR840 RURP840 1.3V 60ns†	MUR1540 RURP1540 1.25V 60ns	RURP3040 1.5V 60ns	RURG3040 1.5V 60ns	RURG5040 1.6V 75ns	RURG8040 1.6V 85ns	RURU5040 1.6V 75ns	RURU8040 1.6V 85ns	RURU10040 1.6V 100ns	RURU15040 1.6V 100ns
500V	RURD450 1.5V 60ns	RURD650 1.5V 60ns	RURD450S 1.5V 60ns	RURD650S 1.5V 60ns	MUR850 RURP850 1.5V 60ns†	MUR1550 RURP1550 1.5V 60ns	RURP3050 1.5V 60ns	RURG3050 1.5V 60ns	RURG5050 1.6V 75ns	RURG8050 1.6V 85ns	RURU5050 1.6V 75ns	RURU8050 1.6V 85ns	RURU10050 1.6V 100ns	RURU15050 1.6V 100ns
600V	RURD460 1.5V 60ns	RURD660 1.5V 60ns	RURD460S 1.5V 60ns	RURD660S 1.5V 60ns	MUR860 RURP860 1.5V 60ns†	MUR1560 RURP1560 1.5V 60ns	RURP3060 1.5V 60ns	RURG3060 1.5V 60ns	RURG5060 1.6V 75ns	RURG8060 1.6V 85ns	RURU5060 1.6V 75ns	RURU8060 1.6V 85ns	RURU10060 1.6V 100ns	RURU15060 1.6V 100ns
700V					MUR870E RURP870 1.8V 110ns	RURP1570 1.8V 125ns	RURP3070 1.8V 150ns	RURG3070 1.8V 150ns	RURG5070 1.9V 200ns	RURG8070 1.9V 200ns	RURU5070 1.9V 200ns	RURU8070 1.9V 200ns	*RURU10070*	RURU15070 1.9V 200ns
800V					MUR880E RURP880 1.8V 110ns	RURP1580 1.8V 125ns	RURP3080 1.8V 150ns	RURG3080 1.8V 150ns	RURG5080 1.9V 200ns	RURG8080 1.9V 200ns	RURU5080 1.9V 200ns	RURU8080 1.9V 200ns	*RURU10080*	RURU15080 1.9V 200ns
900V					MUR890E RURP890 1.8V 110ns	RURP1590 1.8V 125ns	RURP3090 1.8V 150ns	RURG3090 1.8V 150ns	RURG5090 1.9V 200ns	RURG8090 1.9V 200ns	RURU5090 1.9V 200ns	RURU8090 1.9V 200ns	*RURU10090*	RURU15090 1.9V 200ns
1000V					MUR8100E RURP8100 1.8V 110ns	RURP15100 1.8V 125ns	RURP30100 1.8V 150ns	RURG30100 1.8V 150ns	RURG50100 1.9V 200ns	RURG80100 1.9V 200ns	RURU50100 1.9V 200ns	RURU80100 1.9V 200ns	*RURU100100*	RURU150100 1.9V 200ns
1200V	RURD4120 2.1V 90ns	RURD6120 2.1V 90ns	RURD4120S 2.1V 90ns	RURD6120S 2.1V 90ns	RURP8120 2.1V 110ns	RURP15120 2.1V 130ns	RURP30120 2.1V 150ns	RURG30120 2.1V 150ns	RURG50120 2.1 200ns	RURG75120 2.1V 200ns	RURU50120 2.1V 200ns	RURU75120 2.1V 200ns	RURU100120 2.1V200ns	*RURU150120*

ITALICS = Future Product Offerings; V_F at $I_{F(AVG)}$, $T_J = 25^oC$; T_{RR} at $I_{F(AVG)}$, $dI_F/dt = 100A/\mu sec$ $T_J = 25^oC$; † T_{RR} at $I_F = 1A$.

HARRIS DUAL ULTRA-FAST RECOVERY RECTIFIER PRODUCT LINE



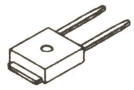
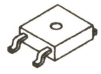
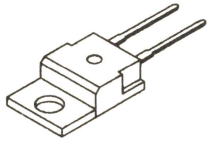
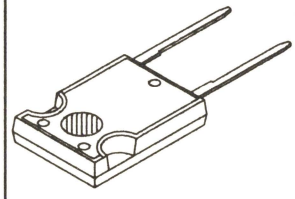
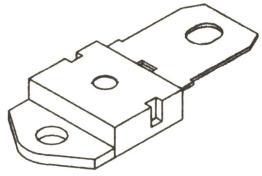




	TO-251AA		TO-252AA		TO-220AB			TO-218		TO-247	
	$I_{F(AVG)}$		$I_{F(AVG)}$		$I_{F(AVG)}$			$I_{F(AVG)}$		$I_{F(AVG)}$	
V_{RRM}	4Ax2	6Ax2	4Ax2	6Ax2	4Ax2	6Ax2	8Ax2	15Ax2	30Ax2	15Ax2	30Ax2
100V	*RURD410CC* 1.0V 35ns	*RURD610CC* 1.0V 35ns	*RURD410CCS* 1.0V 35ns	*RURD610CCS* 1.0V 35ns			BYW51-100 0.95V 35ns† MUR1610CT RURP810CC 0.975V 35ns	MUR3010PT RURH1510CC 1.05V 35ns	RURH3010CC 1.0V 50ns	RURG1510CC 1.05V 35ns	RURG3010CC 1.0V 50ns
150V	*RURD415CC* 1.0V 35ns	*RURD615CC* 1.0V 35ns	*RURD415CCS* 1.0V 35ns	*RURD615CCS* 1.0V 35ns			BYW51-150 0.95V 35ns† MUR1615CT RURP815CC 0.975V 35ns	MUR3015PT RURH1515CC 1.05V 35ns	RURH3015CC 1.0V 50ns	RURG1515CC 1.05V 35ns	RURG3015CC 1.0V 50ns
200V	*RURD420CC* 1.0V 35ns	*RURD620CC* 1.0V 35ns	*RURD420CCS* 1.0V 35ns	*RURD620CCS* 1.0V 35ns			BYW51-200 0.95V 35ns† MUR1620CT RURP820CC 0.975V 35ns	MUR3020PT RURH1520CC 1.05V 35ns	RURH3020CC 1.0V 50ns	RURG1520CC 1.05V 35ns	RURG3020CC 1.0V 50ns
400V	*RURD440CC* 1.5V 60ns		*RURD440CCS* 1.5V 60ns			*RURP640CC* 1.5V 60ns	RURP840CC 1.3V 70ns	MUR3040PT RURH1540CC 1.25V 60ns	RURH3040CC 1.5V 60ns	RURG1540CC 1.5V 60ns	RURG3040CC 1.5V 60ns
500V	*RURD450CC* 1.5V 60ns		*RURD450CCS* 1.5V 60ns			*RURP650CC* 1.5V 60ns	RURP850CC 1.5V 70ns	MUR3050PT RURH1550CC 1.25V 60ns	RURH3050CC 1.5V 60ns	RURG1550CC 1.5V 60ns	RURG3050CC 1.5V 60ns
600V	*RURD460CC* 1.5V 60ns		*RURD4460CCS* 1.5V 60ns			*RURP660CC* 1.5V 60ns	RURP860CC 1.5V 70ns	MUR3060PT RURH1560CC 1.25V 60ns	RURH3060CC 1.5V 60ns	RURG1560CC 1.5V 60ns	RURG3060CC 1.5V 60ns
700V							RURP870CC 1.8V 110ns	RURH1570CC 1.8V 125ns	RURH3070CC 1.8V 150ns	RURG1570CC 1.5V 125ns	RURG3070CC 1.5V 150ns
800V							RURP880CC 1.8V 110ns	RURH1580CC 1.8V 125ns	RURH3080CC 1.8V 150ns	RURG1580CC 1.5V 125ns	RURG3080CC 1.5V 150ns
900V							RURP890CC 1.8V 110ns	RURH1590CC 1.8V 125ns	RURH3090CC 1.8V 150ns	RURG1590CC 1.5V125ns	RURG3090CC 1.5V 150ns
1000V							RURP8100CC 1.8V 110ns	RURH15100CC 1.8V 125ns	RURH30100CC 1.8V 150ns	RURG15100CC 1.5V 125ns	RURG30100CC 1.5V 150ns
1200V					*RURP4120CC* 2.1V 90ns	*RURP6120CC* 2.1V 90ns	RURP8120CC 2.1V 110ns			RURG15120CC 2.1V 130ns	RURG30120CC 2.1 150ns

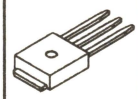
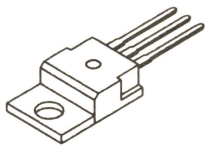
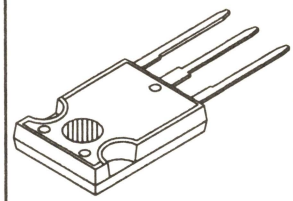
ITALICS = Future Product Offerings; V_F at $I_{F(AVG)}$, $T_J = 25^oC$; T_{RR} at $I_{F(AVG)}$, $dI_F/dt = 100A/\mu sec$ $T_J = 25^oC$; † T_{RR} at $I_F = 1A$.

HARRIS HYPER-FAST RECOVERY RECTIFIER PRODUCT LINE

	 TO-251		 TO-252		 TO-220AC			 2 LEADED TO-247			 SINGLE LEAD TO-218			
	$I_{F(AVG)}$		$I_{F(AVG)}$		$I_{F(AVG)}$			$I_{F(AVG)}$			$I_{F(AVG)}$			
V_{RRM}	4A	6A	4A	6A	8A	15A	30A	30A	50A	75A	50A	75A	100A	150A
400V	RHRD440 2.1V 35ns	RHRD640 2.1V 35ns	RHRD440S 2.1V 35ns	RHRD640S 2.1V 35ns	RHRP840 2.1V 35ns	RHRP1540 2.1V 40ns	RHRP3040 2.1V 45ns	RHRG3040 2.1V 45ns	RHRG5040 2.1V 50ns	RHRG7540 2.1V 60ns	RHRU5040 2.1V 50ns	RHRU7540 2.1V 60ns	RHRU10040 2.1V 60ns	RHRU15040 2.1V 70ns
500V	RHRD450 2.1V 35ns	RHRD650 2.1V 35ns	RHRD450S 2.1V 35ns	RHRD650S 2.1V 35ns	RHRP850 2.1V 35ns	RHRP1550 2.1V 40ns	RHRP3050 2.1V 45ns	RHRG3050 2.1V 45ns	RHRG5050 2.1V 50ns	RHRG7550 2.1V 60ns	RHRU5050 2.1V 50ns	RHRU7550 2.1V 60ns	RHRU10050 2.1V 60ns	RHRU15050 2.1V 70ns
600V	RHRD460 2.1V 35ns	RHRD660 2.1V 35ns	RHRD460S 2.1V 35ns	RHRD660S 2.1V 35ns	RHRP860 2.1V 35ns	RHRP1560 2.1V 40ns	RHRP3060 2.1V 45ns	RHRG3060 2.1V 45ns	RHRG5060 2.1V 50ns	RHRG7560 2.1V 60ns	RHRU5060 2.1V 50ns	RHRU7560 2.1V 60ns	RHRU10060 2.1V 60ns	RHRU15060 2.1V 70ns
700V					RHRP870 3.0V 65ns	RHRP1570 3.0V 70ns	RHRP3070 3.0V 75ns	RHRG3070 3.0V 75ns	RHRG5070 3.0V 95ns	RHRG7570 3.0V 100ns	RHRU5070 3.0V 95ns	RHRU7570 3.0V 100ns		
800V					RHRP880 3.0V 65ns	RHRP1580 3.0V 70ns	RHRP3080 3.0V 75ns	RHRG3080 3.0V 75ns	RHRG5080 3.0V 95ns	RHRG7580 3.0V 100ns	RHRU5080 3.0V 95ns	RHRU7580 3.0V 100ns		
900V					RHRP890 3.0V 65ns	RHRP1590 3.0V 70ns	RHRP3090 3.0V 75ns	RHRG3090 3.0V 75ns	RHRG5090 3.0V 95ns	RHRG7590 3.0V 100ns	RHRU5090 3.0V 95ns	RHRU7590 3.0V 100ns		RHRU15090 3.0V 100ns
1000V					RHRP8100 3.0V 65ns	RHRP15100 3.0V 70ns	RHRP30100 3.0V 75ns	RHRG30100 3.0V 75ns	RHRG50100 3.0V 95ns	RHRG75100 3.0V 100ns	RHRU50100 3.0V 95ns	RHRU75100 3.0V 100ns		RHRU150100 3.0V 100ns
1200V	RHRD4120 3.2V 70ns	*RHRD6120* 3.2V 65ns	RHRD4120S 3.2V 70ns	*RHRD6120S* 3.2V 65ns	RHRP8120 3.2V 70ns	RHRP15120 3.2V 75ns	RHRP30120 3.2V 75ns	RHRG30120 3.2V 75ns	RHRG50120 3.2V 100ns	RHRG75120 3.2V 100ns	RHRU50120 3.2V 100ns	RHRU75120 3.2V 100ns	RHRU100120 3.2V 100ns	*RHRU150120*

ITALICS = Future Product Offerings; V_F at $I_{F(AVG)}$, $T_J = 25°C$; T_{RR} at $I_{F(AVG)}$, $dI_F/dt = 100A/\mu sec$ $T_J = 25°C$; † T_{RR} at $I_F = 1A$

HARRIS DUAL HYPER-FAST RECOVERY RECTIFIER PRODUCT LINE

	 TO-251AA	TO-252AA	 TO-220AB			 TO-247	
	$I_{F(AVG)}$	$I_{F(AVG)}$	$I_{F(AVG)}$			$I_{F(AVG)}$	
V_{RRM}	4Ax2	4Ax2	4Ax2	6Ax2	8Ax2	15Ax2	30Ax2
400V	*RHRD440CC* 2.1V 35ns	*RHRD440CCS* 2.1V 35ns		*RHRP640CC* 2.1V 35ns	RHRP840CC 2.1V 35ns	RHRG1540CC 2.1V 40ns	RHRG3040CC 2.1V 45ns
500V	*RHRD450CC* 2.1V 35ns	*RHRD450CCS* 2.1V 35ns		*RHRP650CC* 2.1V 35ns	RHRP850CC 2.1V 35ns	RHRG1550CC 2.1V 40ns	RHRG3050CC 2.1V 45ns
600V	*RHRD460CC* 2.1V 35ns	*RHRD460CCS* 2.1V 35ns		*RHRP660CC* 2.1V 35ns	RHRP860CC 2.1V 35ns	RHRG1560CC 2.1V 40ns	RHRG3060CC 2.1V 45ns
700V					RHRP870CC 3.0V 65ns	RHRG1570CC 3.0V 70ns	RHRG3070CC 3.0V 75ns
800V					RHRP880CC 3.0V 65ns	RHRG1580CC 3.0V 70ns	RHRG3080CC 3.0V 75ns
900V					RHRP890CC 3.0V 65ns	RHRG1590CC 3.0V 70ns	RHRG3090CC 3.0V 75ns
1000V					RHRP8100CC 3.0V 65ns	RHRG15100CC 3.0V 70ns	RHRG30100CC 3.0V 75ns
1200V			*RHRP4120CC* 3.2V 70ns	*RHRP6120CC* 3.2V 65ns	RHRP8120CC 3.2V 65ns	RHRG15120CC 3.2V 75ns	RHRG30120CC 3.2V 75ns

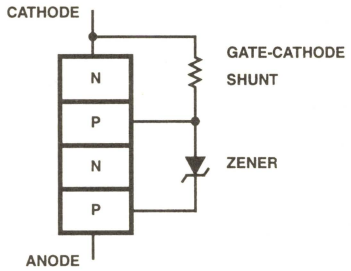
ITALICS = Future Product Offerings; V_F at $I_{F(AVG)}$, $T_J = 25^oC$; T_{RR} at $I_{F(AVG)}$, $dI_F/dt = 100A/\mu sec$ $T_J = 25^oC$

Transient Voltage Suppression Devices

SURGECTOR PRODUCTS

Features

- Protects Electronics and People that may be Exposed to High Energy Transients
- Shunts High Current and Clamps Voltage Induced by Power Line Crosses, Lightning, and Induced High Voltages Away from Sensitive Electronic Circuitry
- SCR-type NPNP Semiconductor Device with Embedded Zener Across Anode-Gate Region
- Used Exclusively for Telecom or Datacom Protection
- UL Approved Under File #E135010 to UL STD 497B



SURGECTOR EQUIVALENT CIRCUIT MODEL

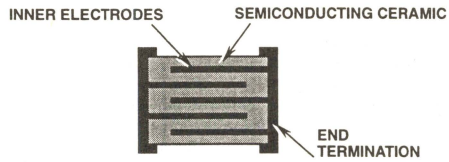
HI-REL MOVs METAL OXIDE VARISTORS

- For Hi-Rel and Military Qualified Products, See the Hi-Rel Sub Section

MLs–MULTI LAYER SUPPRESSORS

Features

- Semiconductor Ceramic Dielectric-Based Device for Protecting Electronic Circuitry and People From Dangerous High Voltage Transients
- More Efficient than Zeners, No Lead Inductance,
- Surface Mount
- Specific Products for Automotive Applications
- EDP, Telecom Applications



ML MECHANICAL STRUCTURE

MOVs–METAL OXIDE VARISTORS

Features

- Zinc Oxide-Based Device For Protecting Electronic Circuitry and People from Dangerous High Voltage Transients
- Every Electronic Circuit has a Need for Transient Voltage Protection, i.e. TVS (Transient Voltage Suppressor)
- Harris has a Device for Every Application
- Used in Virtually any Application; AC, DC, Telecom, Datacom, Power Supplies, Automotive, Motor Control, etc.
- Clamps High Voltage Transients and Absorbs Excess Energy Produced by Transients
- UL Approved Under File #E75961, E56529, and E135010
- CSA Approved Under File #LR91788

SURGECTORs™, MULTI-LAYER Suppressors (MLs), and Metal Oxide Varistors (MOVs) are designed to protect voltage-sensitive circuit components against damage from high-energy transient-voltage spikes. The protection afforded by these devices not only guards expensive and voltage-sensitive equipment from physical damage, but also improves functional reliability in components that can encounter temporary upset due to transient voltages of lower amplitudes.

TYPICAL TRANSIENT SURGE SUPPRESSOR APPLICATIONS

TRANSIENT SURGE SUPPRESSION DEVICES	DATA LINES	TELECOM (PRIMARY)	TELECOM (SECONDARY)	AC POWER LINES	DC POWER AND AUTOMOTIVE
Surgector	X	X	X		
MOV	X	X	X	X	X
Avalanche Diode	X		X		X
Gas Tube		X			
ML	X		X		X

Transient Voltage Suppression Devices

AUTOMOTIVE AUML SERIES
MULTILAYER TRANSIENT SURGE SUPPRESSORS

AnswerFAX Document # 3387

- Leadless Chip Form Surface Mount
- Zero Lead Inductance
- Variety of Energy Ratings Available; (1210, 1812 and 2220 Sizes)
- 125°C Continuous Operating Temperature
- Load Dump Energy Handling Capability per SAE Specification J1113
- Low Profile, Compact Chip Size
- Inherently Bidirectional
- No Plastic or Epoxy Packaging Guarantees Better Than 94V-0 Flammability Rating

AS SERIES
HIGH ENERGY MOV FOR ARRESTER APPLICATIONS

AnswerFAX Document # 2492

- Provided in Disc Form for Unique Packaging by Customer
- Electrode Finish Enables Pressure Contact for Stacking Application
- Available Disc Sizes: 32mm, 42mm and 60mm Diameter
- No Follow Current
- Large Surge Current Capability
- Designed for Lightning Protection of Distribution Transformers

"C" III SERIES
RADIAL LEAD MOV FOR TVSS ENVIRONMENT

AnswerFAX Document # 3540

- Recognized as "Transient Voltage Surge Suppressors" to UL 1449; File # E75961
- Recognized as "Transient Voltage Surge Suppressors" to CSA C22.2, No. 1; File # LR91788
- High Energy Absorption Capability W_{TM}: 45J to 240J (2ms)
- High Peak Pulse Current Capability I_{TM}: 6000A to 9000A (8/20μs)
- Wide Operating Voltage Range $V_{M(AC)RMS}$: 130V to 300V
- Available in Tape and Reel for Automatic Insertion; Also Available Crimped and/or Trimmed

CS SERIES
CONNECTOR PIN MOV

AnswerFAX Document # 2972

- Unique Coaxial Design and Mounting Arrangement
- Wide Operating Voltage Range $V_{M(DC)}$ . . . . . 8V to 38V
- Self Contained Tubular Construction; Requires No Leads or Packages
- New Reduced Length; Less Than Half the Length of Standard CP Series

VARISTOR PRODUCT FAMILY

PEAK CURRENT (A)	ENERGY (J)	MAXIMUM STEADY-STATE APPLIED VOLTAGE	DISC SIZES/ PACKAGES
80 - 500	0.5 - 5.0	CP, CS SERIES	22, 20, 16 GAUGE
150 - 1000	0.2 - 25	AUML, ML, CH SERIES	0805 1812 1206 2220 1210 5 x 8mm
40 - 100	0.07 - 1.7	MA SERIES	3mm
25 - 4500	0.1 - 35	ZA SERIES	5, 7, 10, 14, 20 (mm)
100 - 6500	0.4 - 160	RA SERIES	5 x 8, 10 x 16, 14 x 22 (mm)
1,200 - 9000	11 - 360	"C" III, LA SERIES	7, 10, 14, 20 (mm)
6500	70 - 250	PA SERIES	20mm
25,000 - 40,000	270 - 1,050	HA, DA/ DB SERIES	32, 40 (mm) 40mm
50,000 - 70,000	450 - 10,000	BA/ BB SERIES	60mm
30,000 - 40,000	270 - 1050	NA SERIES	34mm SQ.
20,000 - 100,000	200 - 12,000	CA SERIES AS SERIES	32, 40, 42, 52, 60 (mm)

VOLTS AC RMS: 4, 10, 25, 130, 150, 250, 264, 275, 460, 660, 750, 1,000, 2,800, 6,000

VOLTS DC: 3.5, 14, 35, 175, 200, 330, 365, 369, 615, 850, 970, 1,200, 3,500, 7,000

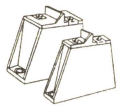
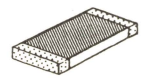
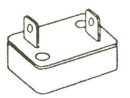
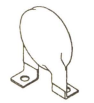
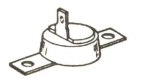
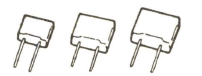
COMPARISON OF SURGE SUPPRESSION DEVICES

TRANSIENT SURGE SUPPRESSION DEVICES	MAJOR ADVANTAGES/USES	MAJOR LIMITATIONS
Surgector	• Ideal for Datacom and Telecom • Leakage . . . . . <50nA • Shunt Capacitance. . . . . <50pF • Subnanosecond Response 8μs x 20μs • Lifetime Unlimited at 200A, 8μs x 20μs Pulse Shape • Failure Mode . . . . . Short Circuit	• Cannot be Used in DC Circuits Where Available Current Exceeds Holding Current • Surge Current Capability 200A - 8μs x 20μs Pulse Shape • Limited AC Line Protection Capability
Metal-Oxide Varistor (MOV)	• Ideal for AC Power Lines; Suitable for Low-Voltage Logic Protection • Subnanosecond Response • Units Available up to . . . . . 70,000A Surge • Lifetime 1000A, 8μs x 20μs Pulse Shape 1000 Surges • Failure Mode - Short Circuit	• Shunt Capacitance. . . . . >500pF • Clamp Voltage Goes Up with Current
Avalanche Diode	• Low-Voltage Logic Protection • Subnanosecond Response • Lifetime 50A, 8 x 20μs Pulse Shape Unlimited • Shunt Capacitance. . . . . 50pF • Failure Mode . . . . . Short Circuit	• Low-Surge Capability, 50A 8μs x 20μs Pulse Shape • Leakage . . . . . Approximately 10mA • Clamp Voltage Goes Up with Current • Leaded Package - Slows Response Time
Gas Tube	• Wide Use in Telecom for Primary Protection • High Surge Capability . . . . . >20,000A • Leakage . . . . . Subpicoamps • Shunt Capacitance. . . . . <1pF • Lifetime 500A, 8μs x 20μs Pulse Width 200 Surges	• Response Time . . . . . <5μs • Failure Mode - Open Circuit • Follow-On Current Because Of "Crowbar" • Trigger Voltage Changes with Time • Limited Life
Multi-Layer (ML)	• Ideal for Automotive, CMOS, and Computer Applications Up to . . . . . 68V • Zero Lead Inductance Surface Mount • 150A, 8μs x 20μs Repetitive Surge Current • Instantaneous Response • Failure Mode - Short Circuit • Low Capacitance Models Available	• Only Available to 68V

Transient Voltage Ordering Information

TRANSIENT VOLTAGE SUPPRESSION DEVICES

MOV SERIES PACKAGES

AS	BA, BB	CA	CH	CP, CS
				
DA	DB	HA	LA, ZA	MA
				
	NA	PA	RA	
				

CA, CP, CS, DA, DB, HA, LA, NA, PA SERIES

V	130	LA	20	A

- A: Selection - Clamping Voltage (A or B)
- 20: Relative Energy Indicator
- LA: Product Series
- 130: Max RMS Applied Voltage
- V: MOV Varistor (Working Voltage)

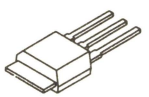
CH, MA, ZA, SERIES

V	220	MA	4	A

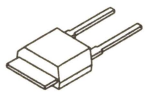
- A: Selection - Clamping Voltage (A or B)
- 4: Relative Energy Indicator
- MA: Product Series
- 220: V_N(DC) Nominal Varistor Voltage
- V: MOV Varistor

SURGECTOR PACKAGES

Modified TO-202 Package Style



PACKAGE A

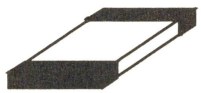


PACKAGE B

SGT	03	U	13

- 13: Holding Current in mA divided by 10
- U: **Type of Surgector**
  - U: Unidirectional
  - B: Bidirectional
  - S: SCR
- 03: Off-State Voltage Rating Divided by 10
- SGT: Surgector

MULTI-LAYER SUPPRESSOR (ML) SERIES PACKAGES

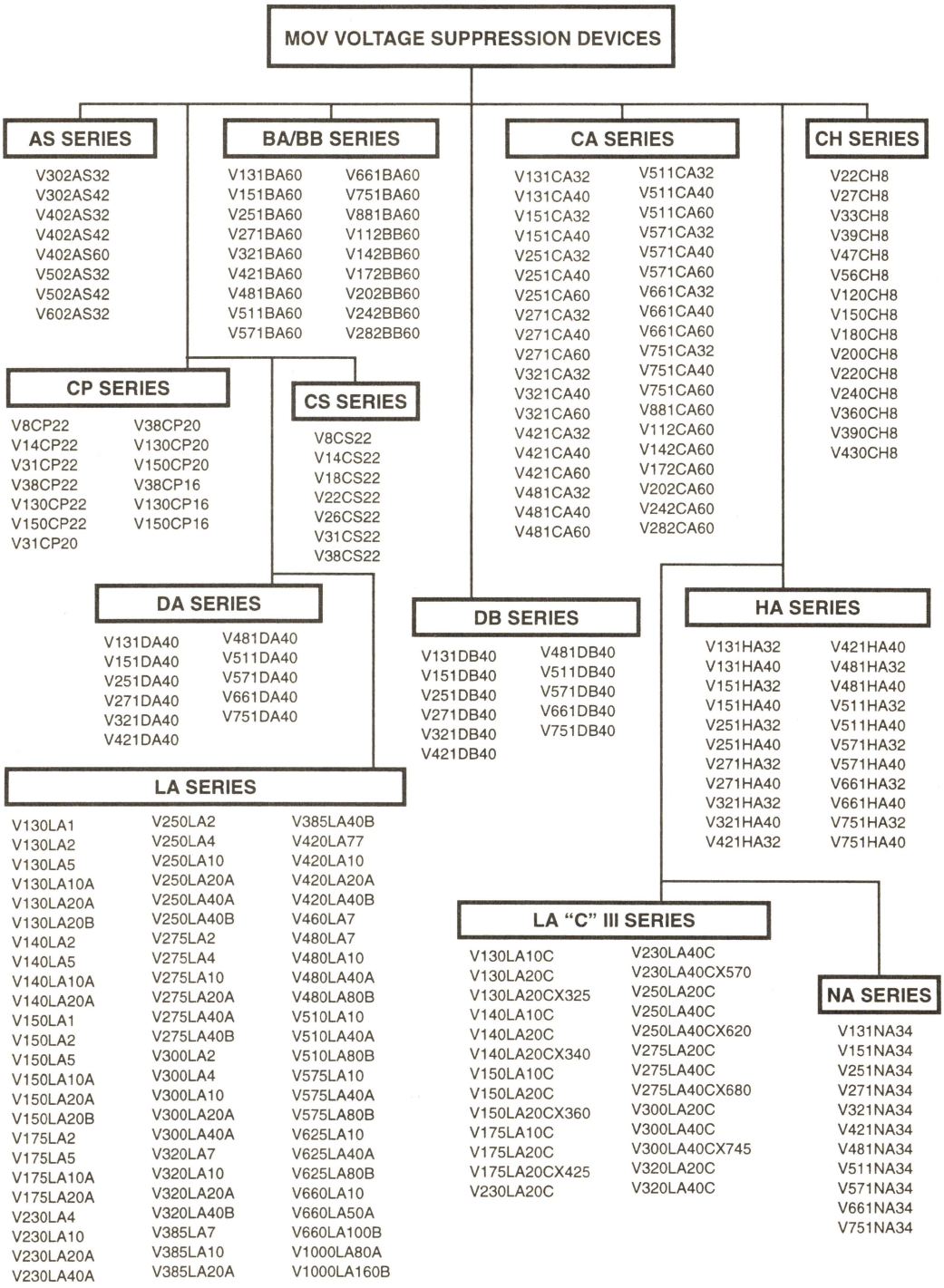


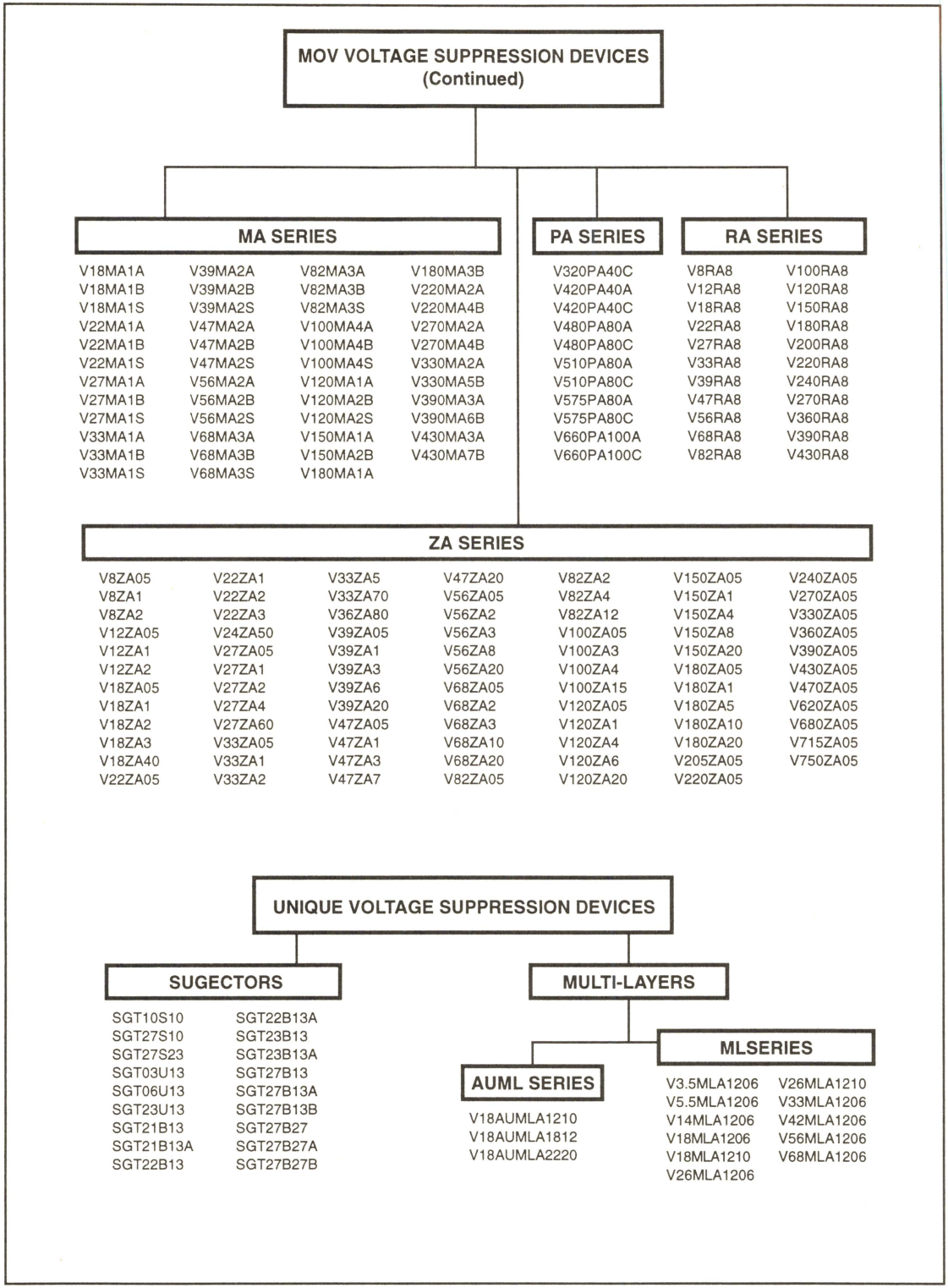
ML SERIES

V	5.5	XXX	1206	A23

- A23: **Packing Quantity**
  - A22: <100 pc Reel
  - H23: 2000 pc Reel
  - T23: 8000 pc Reel
- 1206: Device Size: i.e. 120 mil x 60 mil
- XXX: Product Series
  - AUMLA
  - MLA
- 5.5: DC Working Voltage
- V: ML Suppressor

Transient Voltage Product Selection Trees




MOV VOLTAGE SUPPRESSION DEVICES
(Continued)
MA SERIES
V18MA1A
V18MA1B
V18MA1S
V22MA1A
V22MA1B
V22MA1S
V27MA1A
V27MA1B
V27MA1S
V33MA1A
V33MA1B
V33MA1S
V39MA2A
V39MA2B
V39MA2S
V47MA2A
V47MA2B
V47MA2S
V56MA2A
V56MA2B
V56MA2S
V68MA3A
V68MA3B
V68MA3S
V82MA3A
V82MA3B
V82MA3S
V100MA4A
V100MA4B
V100MA4S
V120MA1A
V120MA2B
V120MA2S
V150MA1A
V150MA2B
V180MA1A
V180MA3B
V220MA2A
V220MA4B
V270MA2A
V270MA4B
V330MA2A
V330MA5B
V390MA3A
V390MA6B
V430MA3A
V430MA7B
PA SERIES
V320PA40C
V420PA40A
V420PA40C
V480PA80A
V480PA80C
V510PA80A
V510PA80C
V575PA80A
V575PA80C
V660PA100A
V660PA100C
RA SERIES
V8RA8
V12RA8
V18RA8
V22RA8
V27RA8
V33RA8
V39RA8
V47RA8
V56RA8
V68RA8
V82RA8
V100RA8
V120RA8
V150RA8
V180RA8
V200RA8
V220RA8
V240RA8
V270RA8
V360RA8
V390RA8
V430RA8
ZA SERIES
V8ZA05
V8ZA1
V8ZA2
V12ZA05
V12ZA1
V12ZA2
V18ZA05
V18ZA1
V18ZA2
V18ZA3
V18ZA40
V22ZA05
V22ZA1
V22ZA2
V22ZA3
V24ZA50
V27ZA05
V27ZA1
V27ZA2
V27ZA4
V27ZA60
V33ZA05
V33ZA1
V33ZA2
V33ZA5
V33ZA70
V36ZA80
V39ZA05
V39ZA1
V39ZA3
V39ZA6
V39ZA20
V47ZA05
V47ZA1
V47ZA3
V47ZA7
V47ZA20
V56ZA05
V56ZA2
V56ZA3
V56ZA8
V56ZA20
V68ZA05
V68ZA2
V68ZA3
V68ZA10
V68ZA20
V82ZA05
V82ZA2
V82ZA4
V82ZA12
V100ZA05
V100ZA3
V100ZA4
V100ZA15
V120ZA05
V120ZA1
V120ZA4
V120ZA6
V120ZA20
V150ZA05
V150ZA1
V150ZA4
V150ZA8
V150ZA20
V180ZA05
V180ZA1
V180ZA5
V180ZA10
V180ZA20
V205ZA05
V220ZA05
V240ZA05
V270ZA05
V330ZA05
V360ZA05
V390ZA05
V430ZA05
V470ZA05
V620ZA05
V680ZA05
V715ZA05
V750ZA05
UNIQUE VOLTAGE SUPPRESSION DEVICES
SUGECTORS
SGT10S10
SGT27S10
SGT27S23
SGT03U13
SGT06U13
SGT23U13
SGT21B13
SGT21B13A
SGT22B13
SGT22B13A
SGT23B13
SGT23B13A
SGT27B13
SGT27B13A
SGT27B13B
SGT27B27
SGT27B27A
SGT27B27B
MULTI-LAYERS
AUML SERIES
V18AUMLA1210
V18AUMLA1812
V18AUMLA2220
MLSERIES
V3.5MLA1206
V5.5MLA1206
V14MLA1206
V18MLA1206
V18MLA1210
V26MLA1206
V26MLA1210
V33MLA1206
V42MLA1206
V56MLA1206
V68MLA1206

SURGECTOR PRODUCTS

Features

- High Input Impedance Until Breakdown (i.e., Low Leakage)
- Repeatable Breakdown/Threshold Voltage
- High Surge Current Handling Capability
- Withstand And Respond To Rapidly Recurring Surges
- Fast Recovery To High Impedance State (Turn Off)
- Dual Polarity Protection
- No Degradation Of Essential Characteristics With Use
- Zener (Avalanche) Diode and SCR-Type Thyristor
- Zener Provides Continuous Low Voltage Protection
- Thyristor Provides Instantaneous Protection Against Fast Rising Transients

SURGECTORs Provide Transient Protection for:

- Central Office Equipment
- Repeaters
- Supervisory Equipment
- Line Concentrator
- Switchgear Equipment
- Receivers
- Data Transmission
- Headsets
- Handsets
- Modem
- EPABX, PABX, PBX
- PCM

Glossary

Var. Clamp - Provides external pin to turn surgector on or off.

Unidirectional - Handles positive OR negative going transient waveforms.

Bidirectional - Handles positive AND negative going transient waveforms.

Clamping Voltage (V_Z) - Off state voltage at a specified current.

Breakdown Voltage (V_{BO}) - Voltage at which the surgector switches from the off state to the on state.

Holding Current (I_H) - Minimum on state current that will hold the surgector in the on state after it has been latched on.

Max Peak Surge Current (I_{TSM}) - Maximum non-repetitive current which may be allowed to flow for the time state.

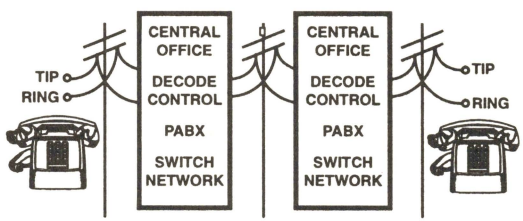


FIGURE 1.

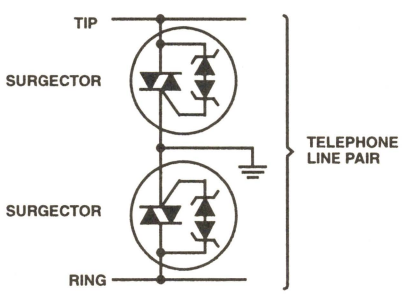


FIGURE 2. TYPICAL APPLICATIONS CIRCUIT

Two bidirectional SURGECTOR devices are placed between the tip and ring lines just after these lines enter the telephone to protect delicate telecommunications equipment.

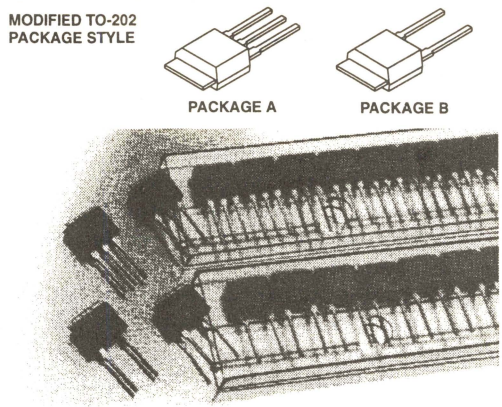
Surgector Selection Guide

Nomenclature, Packages, and Shipping

The SURGECTOR type numbers are easy to interpret. The first three characters - the letter "SGT" - stand for SURGECTOR. Next comes two digits, which represent the maximum off-state voltage divided by 10. Following the voltage is a letter indicating either SCR (S), Unidirectional (U), or Bidirectional (B). The next two digits indicate holding current in milliamps divided by 10.

All versions of the SURGECTOR are housed in a modified TO-202 versatab plastic package. This is a single-in-line package, meaning that all leads come out of the same end and are parallel to one another. The advantage of single-in-line packaging is that it makes the SURGECTOR easy to insert into a circuit board or socket by automated methods.

Surgector Packages

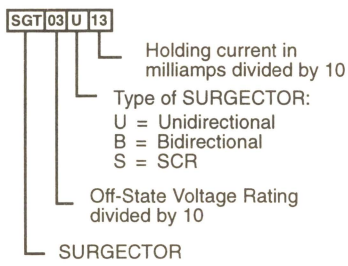


SURGECTOR devices are shipped to the customer either in bulk or on plastic "sticks" designed for automated machinery handling. The sticks are rectangular tubes that hold 50 SURGECTOR devices each.

PART NUMBER	FUNCTION	V_Z MIN (V)	V_{BO} MAX (100V/µs)	I_{TSM} (1 x 2µs)	I_{TSM} (10 x 1000µs)	I_H (mA)	PACKAGE STYLE
SGT10S10 (Note 1)	VAR Clamp	100	Note 1	300	100	>100	A
SGT27S10 (Note 1)	VAR Clamp	270	Note 1	300	100	>100	A
SGT27S23 (Note 1)	VAR Clamp	270	Note 1	300	100	>230	A
SGT03U13	Unidirectional	30	< 50	300	100	>130	B
SGT06U13	Unidirectional	60	< 85	300	100	>130	B
SGT23U13	Unidirectional	230	< 275	300	100	>130	B
SGT21B13	Bidirectional	210	270	300	100	>130	B
SGT21B13A	Bidirectional	210	290	300	100	>130	B
SGT22B13	Bidirectional	220	280	300	100	>130	B
SGT22B13A	Bidirectional	220	290	300	100	>130	B
SGT23B13	Bidirectional	230	290	300	100	>130	B
SGT23B13A	Bidirectional	230	315	300	100	>130	B
SGT27B13	Bidirectional	270	345	300	100	>130	B
SGT27B13A	Bidirectional	270	360	300	100	>130	B
SGT27B13B	Bidirectional	270	375	300	100	>130	B
SGT27B27	Bidirectional	270	345	600	200	>270	B
SGT27B27A	Bidirectional	270	360	600	200	>270	B
SGT27B27B	Bidirectional	270	375	600	200	>270	B

NOTES:

1. Dependent on trigger circuit.
2. All surgectors supplied in modified JEDEC TO-202 Package.
   Package Style A = 3 lead version
   Package Style B = 2 lead version
3. All devices UL recognized to 497B - File Number E135010.



MULTI-LAYER SUPPRESSORS (MLs)

Features

- MLs Clamp Incoming Surge Voltages in a Protective Level
- Particularly Suitable for Surface Mount Applications
- More Energy Handling Capability than Zeners Per Unit Volume
- Faster Clamping Response than Leaded Devices
- Leadless Chip Form - Surface Mount - Zero Lead Inductance
- Available in Tape and Reel for Automatic Pick and Place
- +125°C Operating Temperature
- Low Profile, Compact Chip Size
- Compatible with most Surface Mounting Assembly
- Equipment and Mounting Techniques
- Fastest Response to Transients

ML SERIES DEVICE RATINGS AND CHARACTERISTICS

	MAXIMUM RATINGS (+125°C)					CHARACTERISTICS (+25°C)		
	MAXIMUM CONTINUOUS WORKING VOLTAGE		MAXIMUM NON-REPETITIVE SURGE CURRENT (8/20μs)	MAXIMUM NON-REPETITIVE SURGE ENERGY (10/1000μs)	MAXIMUM CLAMPING VOLTAGE AT 10AMP (8/20μs)	NOMINAL VOLTAGE AT 1mA DC TEST CURRENT		TYPICAL CAPACITANCE
MODEL NUMBER	$V_{M(DC)}$ (V)	$V_{M(AC)}$ (V)	I_{TM} (A)	W_{TM} (J)	V_C (V)	$V_{N(DC)}$ MIN (V)	$V_{N(DC)}$ MAX (V)	f = 1MHz (pF)
V3.5MLA1206	3.5	2.5	100	0.3	14	5.0	7.0	6000
V5.5MLA1206	5.5	4	150	0.4	15.5	7.1	8.7	4500
V14MLA1206	14	10	150	0.4	30	16.4	20	2100
V18MLA1206 (Note 3)	18	14	150	0.4	40	22	27	1700
V18MLA1210 (Note 3)	18	14	250	0.8	40	22	27	1900
V26MLA1206	26	20	150	0.6	56	29.5	38.5	800
V26MLA1210	26	20	250	1.2	54	29.5	38.5	1000
V33MLA1206	33	26	180	0.8	72	38	45	500
V42MLA1206	42	30	180	0.8	86	46	56	450
V56MLA1206	56	40	180	1.0	110	61	76	350
V68MLA1206	68	50	180	1.0	130	76	90	150

NOTES:

1. Typical leakage at +25°C <50μA, maximum leakage 100μA.
2. Average power dissipation of transients for 1206 and 1210 sizes not to exceed 0.10W and 0.15W, respectively.
3. Devices specifically for automotive application.

AUML SERIES (AUTOMOTIVE) DEVICE RATINGS AND CHARACTERISTICS

	MAXIMUM RATINGS (+125°C)			CHARACTERISTICS (+25°C)				
	MAXIMUM CONTINUOUS DC VOLTAGE	JUMP START VOLTAGE (5 MIN)	LOAD DUMP ENERGY (10 PULSES)	NOMINAL VARISTOR VOLTAGE AT 10mA DC TEST CURRENT		MAXIMUM STANDBY LEAKAGE (AT 13V DC)	MAXIMUM CLAMPING VOLTAGE (V_C) AT TEST CURRENT (8/20μs)	
MODEL NUMBER	$V_{M(DC)}$ (V)	V_{JUMP} (V)	W_{LD} (J)	$V_{N(DC)}$ MIN (V)	$V_{N(DC)}$ MAX (V)	I_L (μA)	V_C (V)	I_P (A)
V18AUMLA1210	16	24.5	3	23	32	50	40	1.5
V18AUMLA1812	16	24.5	6	23	32	100	40	5
V18AUMLA2220	16	24.5	25	23	32	200	40	40

NOTES:

1. Average power dissipation of transients not to exceed 0.15W, 0.3W and 1W for model sizes 1210, 1812 and 2220 respectively.
2. Load dump energy rating (into the suppressor) of a voltage transient with a time constant of 115ms to 230ms.
3. Thermal shock capability per MIL-STD-750, Method 1051: -55°C to +125°C, 5 minutes at +25°C, 25 Cycles: 15 minutes at each extreme.
4. For application specific requirements, please contact Harris sales office.

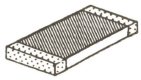
MOV Transient Voltage Suppression Devices

SPECIAL PRODUCTS FOR SPECIAL APPLICATIONS

Features

- Wide Voltage/Energy Range
- Excellent Clamp Ratio
- Fast Response Time
- Low Standby Power
- ISO 9000 Approved
- IEC Conformance
- No Follow-On Current
- DESC (QPL) Parts
- UL Recognized
- Rad Hard
- CSA Recognized
- CECC Approved

CH SERIES SURFACE-MOUNT VARISTORS



- UL/CSA Recognized
- Higher Reliability
- Save on Board Real Estate
- Increases Circuit Density

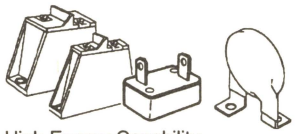
ZA SERIES

- Radial Package
- Low Voltage Operation
- UL/CSA Recognized
- CECC Approved

"C"III/LA SERIES

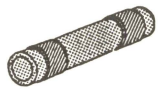
- Radial Package
- Line Voltage Operation
- UL/CSA Recognized
- CECC Approved

BB, BA, DA, DB, HA SERIES



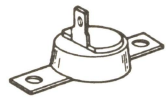
- High Energy Capability
- Rigid Terminals
- Isolated
- Low Inductance
- Improved Creep and Strike
- UL/CSA Recognized

CS/CP SERIES CONNECTOR PIN VARISTORS



- Provides Protection in Connectors
- 22, 20 and 16 Pin Gauge Size
- Rad Hard
- Compact Size
- Solderable

PA SERIES



- Rigid Mountdown
- NEMA Creep and Strike Distance
- Quick Connect Terminal
- UL/CSA Recognized

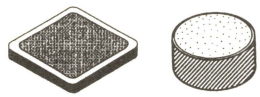
AS SERIES

- Arrester Discs

MA SERIES

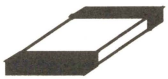
- Axial Package
- Wide Voltage
- Automatic Insertion

NA, CA SERIES



- Industrial Discs
- Solderable Contacts
- Edge Passivation

AUML/ML SERIES



- Surface Mount
- Significant Size Reduction
- High Reliability

HIGH-RELIABILITY SERIES

- 100% Prescreened
- 100% Process Conditioning
- Meets Military Specifications
- DESC (QPL) Parts
- Rad Hard
- CECC

RA SERIES

- Low Profile
- High Temperature Capability
- In-Line Leads
- Precise Seating Plane
- UL/CSA Recognized

MOV Transient Voltage Selection Guide

CH, CP, CS, MA SERIES NOMINAL VOLTAGE SELECTION

VOLTAGE			CH SERIES	CP SERIES			CS SERIES	MA SERIES
$V_{m(AC)}$	$V_{m(DC)}$	$V_{n(DC)}$	5 x 8mm	16 GAUGE	20 GAUGE	22 GAUGE	22 GAUGE	3mm
6	8	16				V8CP22	V8CS22	
9	13	18						V18MA1A
10	14	18						V18MA1B, S
10	15	22						V22MA1A
14	18	22	V22CH8			V14CP22	V14CS22	V22MA1B, S
14	18	24					V18CS22	
13	19	27						V27MA1A
17	22	27	V27CH8				V22CS22	V27MA1B, S
18	23	33						V33MA1A
20	26	33	V33CH8				V26CS22	V33MA1B, S
22	28	39						V39MA2A
25	31	39	V39CH8		V31CP20	V31CP22	V31CS22	V39MA2B, S
27	34	47						V47MA2A
30	38	47	V47CH8	V38CP16	V38CP20	V38CP22	V38CS22	V47MA2B, S
32	40	56						V56MA2A
35	45	56	V56CH8					V56MA2B, S
38	48	68						V68MA3A
40	56	68						V68MA3B, S
45	60	82						V82MA3A
50	66	82						V82MA3B, S
57	72	100						V100MA4A
60	81	100	V100CH8					V100MA4B, S
72	97	120						V120MA1A
75	101	120						V120MA2B, S
75	102	120	V120CH8					
88	121	150						V150MA1A
92	127	150						V150MA2B
95	127	150	V150CH8					
105	144	180						V180MA1A
110	152	180						V180MA3B
115	153	180	V180CH8					
130	130	200		V130CP16	V130CP20	V130CP22		

CH, CP, CS, MA SERIES NOMINAL VOLTAGE SELECTION (Continued)

VOLTAGE			CH SERIES	CP SERIES			CS SERIES	MA SERIES
$V_{m(AC)}$	$V_{m(DC)}$	$V_{n(DC)}$	5 x 8mm	16 GAUGE	20 GAUGE	22 GAUGE	22 GAUGE	3mm
130	175	200	V200CH8					
132	181	220						V220MA2A
138	191	220						V220MA4B
140	180	220	V220CH8					
150	150	240		V150CP16	V150CP20	V150CP22		
150	200	240	V240CH8					
163	224	270						V270MA2A
171	235	270						V270MA4B
188	257	330						V330MA2A
200	274	330						V330MA5B
230	300	360	V360CH8					
234	322	390						V390MA3A
242	334	390						V390MA6B
250	330	390	V390CH8					
253	349	430						V430MA3A
264	365	430						V430MA7B
275	369	430	V430CH8					

LA, ZA, AND RA SERIES NOMINAL VOLTAGE SELECTION

VOLTAGE			LA, ZA SERIES					RA SERIES		
$V_{m(AC)}$	$V_{m(DC)}$	$V_{n(DC)}$	5mm	7mm	10mm	14mm	20mm	5 x 8mm	10 x 16mm	14 x 22mm
4	5.5	6 - 11	V8ZA05	V8ZA1	V8ZA2			V8RA8		
6	8	9 - 16	V12ZA05	V12ZA1	V12ZA2			V12RA8		
10	14	14.4 - 21.6	V18ZA05	V18ZA1	V18ZA2	V18ZA3	V18ZA40	V18RA8	V18RA16	
14	18	18.7 - 26	V22ZA05	V22ZA1	V22ZA2	V22ZA3		V22RA8	V22RA16	
14	18	19.2 - 26					V24ZA50			V24RA22
17	22	23 - 31.1	V27ZA05	V27ZA1	V27ZA2	V27ZA4	V27ZA60	V27RA8	V27RA16	
20	26	29.5 - 38	V33ZA05							
20	26	29.5 - 36.5		V33ZA1	V33ZA2	V33ZA5		V33RA8	V33RA16	
21	27	29.5 - 36.5					V33ZA70			
23	31	32 - 40					V36ZA80			V36RA22
25	31	35 - 46	V39ZA05							

LA, ZA, AND RA SERIES NOMINAL VOLTAGE SELECTION (Continued)

VOLTAGE			LA, ZA SERIES					RA SERIES		
$V_{m(AC)}$	$V_{m(DC)}$	$V_{n(DC)}$	5mm	7mm	10mm	14mm	20mm	5 x 8mm	10 x 16mm	14 x 22mm
25	31	35 - 43		V39ZA1	V39ZA3	V39ZA6	V39ZA20	V39RA8	V39RA16	
30	38	42 - 55	V47ZA05							
30	38	42 - 52		V47ZA1	V47ZA3	V46Z17	V47ZA20	V47RA8	V47RA16	
35	45	50 - 66	V56ZA05							
35	45	50 - 62		V56ZA2	V56ZA3	V56ZA8	V56ZA20	V56RA8	V56RA16	
40	56	61 - 80	V68ZA05							
40	56	61 - 75		V68ZA2	V68ZA3	V68ZA10	V68ZA20	V68RA8	V68RA16	
50	66	73 - 97	V82ZA05							
50	66	73 - 91		V82ZA2	V82ZA4	V82ZA12		V82RA8	V82RA16	
60	81	90 - 117	V100ZA05							
60	81	90 - 110		V100ZA3	V100ZA4	V100ZA15		V100RA8	V100RA16	
75	102	108 - 138	V120ZA05							
75	102	108 - 132		V120ZA1	V120ZA4	V120ZA6	V120ZA20	V120RA8	V120RA16	
90	127	135 - 173	V150ZA05							
92	127	135 - 165		V150ZA1	V150ZA4	V150ZA8	V150ZA20	V150RA8	V150RA16	
110	153	162 - 207	V180ZA05							
115	153	162 - 198		V180ZA1	V180ZA5	V180ZA10	V180ZA20	V180RA8	V180RA16	
130	170	184 - 226	V205ZA05							
130	175	184 - 255	V130LA1							
130	175	184 - 228		V130LA2	V130LA5	V130LA10A	V130LA20A	V200RA8	V200RA16	V200RA22
130	175	184 - 220					V130LA20B			
140	180	198 - 253	V220ZA05							
140	180	198 - 242		V140LA2	V140LA5	V140LA10A		V220RA8	V220RA16	
140	180	198 - 228					V140LA20A			
150	200	216 - 264	V240ZA05							
150	200	212 - 284	V150LA1							
150	200	212 - 268		V150LA2	V150LA5	V150LA10A	V150LA20A	V240RA8	V240RA16	V240RA22
150	200	212 - 243					V150LA20B			
175	225	243 - 311	V270ZA05							
175	225	247 - 303		V175LA2	V175LA5	V175LA10A	V175LA20A	V270RA8	V270RA16	V270RA22
210	275	297 - 380	V330ZA05							
230	300	324 - 396	V360ZA05	V230LA4	V230LA10	V230LA20A	V230LA40A	V360RA8	V360RA16	

LA, ZA, AND RA SERIES NOMINAL VOLTAGE SELECTION (Continued)

VOLTAGE			LA, ZA SERIES					RA SERIES		
$V_{m(AC)}$	$V_{m(DC)}$	$V_{n(DC)}$	5mm	7mm	10mm	14mm	20mm	5 x 8mm	10 x 16mm	14 x 22mm
250	330	351 - 449	V390ZA05							
250	330	354 - 473		V250LA2						
250	330	354 - 429		V250LA4	V250LA10	V250LA20A	V250LA40A	V390RA8	V390RA16	V390RA22
250	330	354 - 413					V250LA40B			
275	369	387 - 495	V430ZA05							
275	369	389 - 515	V275LA2							
275	369	389 - 473		V274LA4	V275LA10	V275LA20A	V275LA40A	V430RA8	V430RA16	V430RA22
275	369	389 - 453					V275LA40B			
300	385	420 - 517	V470ZA05							
300	405	420 - 565		V300LA2						
300	405	420 - 517		V300LA4	V300LA10	V300LA20A	V300LA40A			
320	420	462 - 565		V320LA7	V320LA10	V320LA20A				
320	420	462 - 540					V320LA40B			
385	505	558 - 682	V620ZA05	V385LA7	V385LA10	V385LA20A	V385LA40B			
420	560	610 - 748	V680ZA05	V420LA7	V420LA10	V420LA20A				
420	560	610 - 720					V420LA40B			
440	585	643 - 787	V715ZA05							
460	615	702 - 858		V460LA7						
460	615	675 - 825	V750ZA05							
480	640	670 - 825		V480LA7	V480LA10	V480LA40A				
480	640	670 - 790					V480LA80B			
510	675	735 - 910			V510LA10	V510LA40A				
510	675	735 - 860					V510LA80B			
575	730	805 - 1000			V575LA10	V575LA40A				
575	730	805 - 960					V575LA80B			
625	825	940 - 1210			V625LA10	V625LA40A				
625	825	940 - 1100					V625LA80B			
660	850	940 - 1210			V660LA10	V660LA50A				
660	850	940 - 1100					V660LA100B			
1000	1200	1425 - 1800				V1000LA80A				
1000	1200	1425 - 1600					V1000LA160B			

AUML AND ML SERIES NOMINAL VOLTAGE SELECTION

VOLTAGE RATINGS				AUML AND ML SERIES				
$V_{m(AC)}$	$V_{m(DC)}$	$V_{n(DC)}$ MIN	$V_{n(DC)}$ MAX	0805 SERIES	1206 SERIES	1210 SERIES	1812 SERIES	2220 SERIES
2.5	3.5	5	7		V3.5MLA1206			
2.5	3.5	3.7	5.5	V3.5MLA0805 V3.5MLA0805L				
4	5.5	7.1	8.7		V5.5MLA1206			
4	5.5	7.1	9.3	V5.5MLA0805 V5.5MLA0805L				
10	14	16.4	20		V14MLA1206			
10	14	15.9	20.3	V14MLA0805 V14MLA0805L				
-	16	23	32			V18AUMLA1210	V18AUMLA1812	V18AUMLA2220
14	18	22	27		V18MLA1206	V18MLA1210		
14	18	22.5	28	V18MLA0805 V18MLA0805L				
20	26	29.5	38.5		V26MLA1206	V26MLA1210		
26	33	38	45		V33MLA1206			
30	42	46	56		V42MLA1206			
40	56	61	76		V56MLA1206			
50	68	76	90		V68MLA1206			

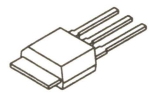
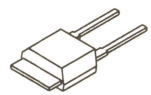
LA "C" III SERIES (SUPERMOV) NOMINAL VOLTAGE SELECTION

VOLTAGE RATINGS			LA "C" III SERIES	
$V_{m(AC)}$	$V_{n(DC)}$ MIN	$V_{n(DC)}$ MAX	14mm	20mm
130	184	228	V130LA10C	V130LA20C
130	184	220		V130LA20CX325
140	198	242	V140LA10C	V140LA20C
140	198	230		V140LA20CX340
150	212	268	V150LA10C	V150LA20C
150	212	243		V150LA20CX360
175	247	303	V175LA10C	V175LA20C
175	247	285		V175LA20CX425
230	324	396	V230LA20C	V230LA40C
230	324	384		V230LA40CX570
250	354	429	V250LA20C	V250LA40C
250	354	413		V250LA40CX620
275	389	473	V275LA20C	V275LA40C
275	389	453		V275LA40CX680
300	400	540	V300LA20C	V300LA40C
300	400	520		V300AL40CX745
320	462	565	U320LA20C	V320LA40C

AS SERIES NOMINAL VOLTAGE SELECTION

VOLTAGE		AS SERIES		
RATED	V_{RMS} VOLTAGE (MCOV)	32mm	42mm	60mm
3000	2550	V302AS32	V302AS42	
4000	3400	V402AS32	V402AS42	V402AS60

SURGECTOR VOLTAGE SELECTION GUIDE

TYPE NO.	FUNCTION	V_Z MIN V	V_{BO} MAX (100V/μs)	I_{TSM} (1 x 2μs)	I_{TSM} (10 x 1000μs)	I_H mA	PACKAGE STYLE
SGT10S10	Var. Clamp	100	(Note 1)	300	100	>100	
SGT27S10	Var. Clamp	270	(Note 1)	300	100	>100	
SGT27S23	Var. Clamp	270	(Note 1)	300	100	>230	
SGT03U13 (Note 2)	Uni-Directional	30	<50	300	100	>130	
SGT06U13 (Note 2)	Uni-Directional	60	<85	300	100	>130	
SGT23U13 (Note 2)	Uni-Directional	230	<275	300	100	>130	
SGT21B13	Bi-Directional	210	270	300	100	>130	
SGT21B13A	Bi-Directional	210	290	300	100	>130	
SGT22B13	Bi-Directional	220	280	300	100	>130	
SGT22B13A	Bi-Directional	220	290	300	100	>130	
SGT23B13	Bi-Directional	230	290	300	100	>130	
SGT23B13A (Note 2)	Bi-Directional	230	315	300	100	>130	
SGT27B13	Bi-Directional	270	345	300	100	>130	
SGT27B13A (Note 2)	Bi-Directional	270	360	300	100	>130	
SGT27B13B	Bi-Directional	270	375	300	100	>130	
SGT27B27 (Note 2)	Bi-Directional	270	345	600	200	>270	
SGT23B27A	Bi-Directional	270	360	600	200	>270	
SGT27B27B	Bi-Directional	270	375	600	200	>270	

NOTES:

1. Dependent on trigger circuit.
2. All finalized types UL recognized to 497B - File Number E135010.

PA, NA, HA, DA, DB, CA, BA/BB SERIES NOMINAL VOLTAGE SELECTION

VOLTAGE			PA SERIES	NA SERIES	HA SERIES		DA SERIES	DB SERIES	CA SERIES			BA/BB SERIES
$V_{m(AC)}$	$V_{m(DC)}$	$V_{n(DC)}$	20mm	34x34mm	32mm	40mm	40mm	40mm	32mm	40mm	60mm	60mm
130	175	200	V130PA20A,C	V131NA34	V131HA32	V131HA40	V131DA40	V131DB40	V131CA32	V131CA40		V131BA60
150	200	240	V150PA20A,C	V151NA34	V151HA32	V151HA40	V151DA40	V151DB40	V151CA32	V151CA40		V151BA60
250	330	390	V250PA40A,C	V251NA34	V251HA32	V251HA40	V251DA40	V251DB40	V251CA32	V251CA40	V251CA60	V251BA60
275	369	430	V275PA40A,C	V271NA34	V271HA32	V271HA40	V271DA40	V271DB40	V271CA32	V271CA40	V271CA60	V271BA60
320	420	510	V320PA40A,C	V321NA34	V321HA32	V321HA40	V321DA40	V321DB40	V321CA32	V321CA40	V321CA60	V321BA60
420	560	680	V420PA40A,C	V421NA34	V421HA32	V421HA40	V421DA40	V421DB40	V421CA32	V421CA40	V421CA60	V421BA60
480	640	750	V480PA80A,C	V481NA34	V481HA32	V481HA40	V481DA40	V481DB40	V481CA32	V481CA40	V481CA60	V481BA60
510	675	820	V510PA80A,C	V511NA34	V511HA32	V511HA40	V511DA40	V511DB40	V511CA32	V511CA40	V511CA60	V511BA60
575	730	910	V575PA80A,C	V571NA34	V571HA32	V571HA40	V571DA40	V571DB40	V571CA32	V571CA40	V571CA60	V571BA60
660	850	1050	V660PA100A,C	V661NA34	V661HA32	V661HA40	V661DA40	V661DB40	V661CA32	V661CA40	V661CA60	V661BA60
750	970	1200		V751NA34	V751HA32	V751HA40	V751DA40	V751DB40	V751CA32	V751CA40	V751CA60	V751BA60
880	1150	1500									V881CA60	V881BA60
1100	1400	1800									V112CA60	V112BB60
1400	1750	2200									V142CA60	V142BB60
1700	2150	2700									V172CA60	V172BB60
2000	2500	3300									V202CA60	V202BB60
2400	3000	3900									V242CA60	V242BB60
2800	3500	4700									V282CA60	V282BB60

Transient Voltage Device Ratings and Specifications

CP SERIES

MODEL NUMBER	PART SIZE	MAXIMUM RATINGS (+125°C)				SPECIFICATIONS (+25°C)						
		CONTINUOUS		TRANSIENT					MAX CLAMPING VOLTAGE V_C AT TEST CURRENT (8/20μs)		CAPACITANCE AT f = 1MHz	
		V_{RMS}	V_{DC}	ENERGY (10/1000μs)	PEAK CURRENT (8/20μs)	VARISTOR VOLTAGE AT 1mA DC TEST CURRENT						
		$V_{M(AC)}$	$V_{M(DC)}$	W_{TM}	I_{TM}	MIN	$V_{N(DC)}$	MAX	V_C	I_P	MIN	MAX
		(V)	(V)	(J)	(A)	(V)	(V)	(V)	(V)	(A)	(pF)	(pF)
V8CP22	22B	6.0	8.0	1.5	250	12.5	16.0	19.5	34.0	10	1600	2950
V14CP22	22B	10.0	14.0	1.5	250	18.5	22.0	25.5	42.0	10	1600	2950
V31CP22	22B	25.0	31.0	1.5	250	35.0	39.0	48.0	85.0	5	450	1950
V38CP22	22B	30.0	38.0	1.5	250	42.0	47.0	58.0	100.0	5	450	1950
V130CP22	22A	130.0	130.0	2.4	300	184.0	200.0	228.0	375.0	5	150	350
V150CP22	22A	150.0	150.0	2.4	300	212.0	240.0	268.0	430.0	5	100	300
V31CP20	20B	25.0	31.0	2.0	300	35.0	39.0	48.0	85.0	10	700	2200
V38CP20	20B	30.0	38.0	2.0	300	42.0	47.0	58.0	100.0	10	650	1950
V130CP20	20A	130.0	130.0	3.0	400	184.0	200.0	228.0	375.0	10	150	400
V150CP20	20A	150.0	150.0	3.0	400	212.0	240.0	268.0	430.0	10	100	350
V38CP16	16A	30.0	38.0	3.0	350	42.0	47.0	58.0	100.0	20	1000	2750
V130CP16	16A	130.0	130.0	5.0	500	184.0	200.0	228.0	375.0	20	250	700
V150CP16	16A	150.0	150.0	5.0	500	212.0	240.0	268.0	430.0	20	200	650

NOTE: Average power dissipation of transients not to exceed 250mW, 300mW and 350mW for sizes 22AWG, 20AWG and 16AWG, respectively.

CS SERIES

MODEL NUMBER	PART SIZE	MAXIMUM RATINGS (+125°C)			SPECIFICATIONS (+25°C)				
		CONTINUOUS	TRANSIENT		VARISTOR VOLTAGE AT 1mA DC TEST CURRENT		MAXIMUM CLAMPING VOLTAGE V_C AT 10A (8/20μs)	CAPACITANCE AT f = 1MHz	
		V_{DC}	ENERGY (10/1000μs)	PEAK CURRENT (8/20μs)	$V_{N(DC)}$			C	
		$V_{M(DC)}$	W_{TM}	I_{TM}	MIN	MAX	V_C	MIN	MAX
		(V)	(V)	(A)	(V)		(V)	(pF)	
V8CS22	22B	8	0.5	80	13.5	19.5	36	830	1550
V14CS22	22B	14	0.5	80	18.5	25.5	44	675	1250
V18CS22	22B	18	0.5	80	22.5	27.9	47	600	1200
V22CS22	22B	22	0.5	100	27.5	34.5	57	540	1050
V26CS22	22B	26	0.5	100	29.5	36.5	68	510	960
V31CS22	22B	31	0.5	100	35.0	48.0	85	450	880
V38CS22	22B	38	0.5	100	42.0	58.0	100	350	770

CH SERIES

V82 - V240 CH Varistors are listed under UL file #E75961 as a recognized component.
Series CH Varistors are listed under UL file #E135010 as a recognized component.

MODEL NUMBER	MAXIMUM RATINGS (+125°C)				SPECIFICATIONS (+25°C)					
	CONTINUOUS		TRANSIENT							
	V_{RMS}	V_{DC}	ENERGY (10/1000μs)	PEAK CURRENT (8/20μs)	VARISTOR VOLTAGE AT 1mA DC TEST CURRENT			MAX CLAMPING VOLT V_C AT TEST CURRENT (8/20μs)		TYPICAL CAPACITANCE
	$V_{M(AC)}$	$V_{M(DC)}$	W_{TM}	I_{TM}	MIN	$V_{N(DC)}$	MAX	V_C	I_P	f = 1MHz
	(V)	(V)	(J)	(A)	(V)	(V)	(V)	(V)	(A)	(pF)
V22CH8	14	18 (Note 3)	10.0 (Note 2)	250	18.7	22.0	26.0	47	5	1600
V27CH8	17	22	1.0	250	23.0	27.0	31.1	57	5	1300
V33CH8	20	26	1.2	250	29.5	33.0	36.5	68	5	1100
V39CH8	25	31	1.5	250	35.0	39.0	43.0	79	5	900
V47CH8	30	38	1.8	250	42.0	47.0	52.0	92	5	800
V56CH8	35	45	2.3	250	50.0	56.0	62.0	107	5	700
V120CH8	75	102	6.0	500	108.0	120.0	132.0	200	10	300
V150CH8	95	127	8.0	500	135.0	150.0	165.0	250	10	250
V180CH8	115	153	10.0	500	162.0	180.0	198.0	295	10	200
V200CH8	130	175	11.0	500	184.0	200.0	228.0	340	10	180
V220CH8	140	180	12.0	500	198.0	220.0	242.0	360	10	160
V240CH8	150	200	13.0	500	212.0	240.0	268.0	395	10	150
V360CH8	230	300	20.0	500	324.0	360.0	396.0	595	10	100
V390CH8	250	330	21.0	500	354.0	390.0	429.0	650	10	90
V430CH8	275	369	23.0	500	389.0	430.0	473.0	710	10	80

NOTES:

1. Power dissipation of transients not to exceed 0.25W.
2. Energy rating for impulse duration of 30ms minimum to one half of peak current value.
3. Also rated to withstand 24V for 5 minutes.

ZA SERIES

ZA Series Varistors are listed under UL File No. E135010 as a UL recognized component.

(NOTE 1) MODEL NUMBER	MODEL SIZE DISC DIA. (mm)	DEVICE MARKING	MAXIMUM RATING (85°C)				SPECIFICATIONS (25°C)				
			CONTINUOUS		TRANSIENT		VARISTOR VOLTAGE AT 1mA DC TEST CURRENT		MAXIMUM CLAMPING VOLTAGE 8 x 20μs		TYPICAL CAPACITANCE f = 1MHz
			V_{RMS}	V_{DC}	ENERGY 10 x 1000μs	PEAK CURRENT 8 x 20μs					
			$V_{M(AC)}$	$V_{M(DC)}$	W_{TM}	I_{TM}	V_{NOM} MIN	V_{NOM} MAX	V_C	I_{PK}	C
			(V)	(V)	(J)	(A)	(V)		(V)	(A)	(pF)
V8ZA05	5	Z08	4	5.5	0.1	50	6	11	30	1	1400
V8ZA1	7	08Z1	4	5.5	0.4	100	6	11	22	2.5	3000
V8ZA2	10	08Z2	4	5.5	0.8	250	6	11	20	5	7500

ZA SERIES (Continued)

ZA Series Varistors are listed under UL File No. E135010 as a UL recognized component.

(NOTE 1) MODEL NUMBER	MODEL SIZE DISC DIA. (mm)	DEVICE MARKING	MAXIMUM RATING (85°C)				SPECIFICATIONS (25°C)				
			CONTINUOUS		TRANSIENT		VARISTOR VOLTAGE AT 1mA DC TEST CURRENT		MAXIMUM CLAMPING VOLTAGE 8 x 20μs		TYPICAL CAPACITANCE f = 1MHz
			V_{RMS}	V_{DC}	ENERGY 10 x 1000μs	PEAK CURRENT 8 x 20μs	V_{NOM} MIN	V_{NOM} MAX	V_C	I_{PK}	C
			$V_{M(AC)}$	$V_{M(DC)}$	W_{TM}	I_{TM}					
			(V)	(V)	(J)	(A)	(V)		(V)	(A)	(pF)
V12ZA05	5	Z12	6	8	0.14	50	9	16	37	1	1200
V12ZA1	7	12Z1	6	8	0.6	100	9	16	34	2.5	2500
V12ZA2	10	12Z2	6	8	1.2	250	9	16	30	5	6000
V18ZA05	5	Z18	10	14	0.17	100	14.4	21.6	36	1	1000
V18ZA1	7	18Z1	10	14	0.8	250	14.4	21.6	36	2.5	2000
V18ZA2	10	18Z2	10	14	1.5	500	14.4	21.6	36	5	5000
V18ZA3	14	18Z3	10	14	3.5	1000	14.4	21.6	36	10	11000
V18ZA40	20	18Z40	10	14	80 (Note 2)	2000	14.4 (Note 3)	21.6	37	20	22000
V22ZA05	5	Z22	14	18	0.2	100	18.7	26	43	1	800
V22ZA1	7	22Z1	14	18	0.9	250	18.7	26	43	2.5	1600
V22ZA2	10	22Z2	14	18	2	500	18.7	26	43	5	4000
V22ZA3	14	22Z3	14	18	4	1000	18.7	26	43	10	9000
V24ZA50	20	24Z50	14	18 (Note 4)	100 (Note 2)	2000	19.2 (Note 3)	26	43	20	15000
V27ZA05	5	Z27	17	22	0.25	100	23	31.1	53	1	600
V27ZA1	7	27Z1	17	22	1	250	23	31.1	53	2.5	1300
V27ZA2	10	27Z2	17	22	2.5	500	23	31.1	53	5	3000
V27ZA4	14	27Z4	17	22	5	1000	23	31.1	53	10	7000
V27ZA60	20	27Z60	17	22	120 (Note 2)	2000	23 (Note 3)	31.1	50	20	13000
V33ZA05	5	Z33	20	26	0.3	100	29.5	38	65	1	500
V33ZA1	7	33Z1	20	26	1.2	250	29.5	36.5	65	2.5	1100
V33ZA2	10	33Z2	20	26	3	500	29.5	36.5	65	5	2700
V33ZA5	14	33Z5	20	26	6	1000	29.5	36.5	65	10	6000
V33ZA70	20	33Z70	21	27	150 (Note 2)	2000	29.5 (Note 3)	36.5	58	20	13000
V36ZA80	20	36Z80	23	31	160 (Note 2)	2000	32 (Note 3)	40	63	20	12000
V39ZA05	5	Z39	25	31	0.3	100	35	46	79	1	500
V39ZA1	7	39Z1	25	31	1.2	250	35	43	79	2.5	1100
V39ZA3	10	39Z3	25	31	3	500	35	43	76	5	2700

ZA SERIES (Continued)

ZA Series Varistors are listed under UL File No. E135010 as a UL recognized component.

(NOTE 1) MODEL NUMBER	MODEL SIZE DISC DIA. (mm)	DEVICE MARKING	MAXIMUM RATING (85°C)				SPECIFICATIONS (25°C)				
			CONTINUOUS		TRANSIENT		VARISTOR VOLTAGE AT 1mA DC TEST CURRENT		MAXIMUM CLAMPING VOLTAGE 8 x 20μs		TYPICAL CAPACITANCE f = 1MHz
			V_{RMS}	V_{DC}	ENERGY 10 x 1000μs	PEAK CURRENT 8 x 20μs	V_{NOM} MIN	V_{NOM} MAX	V_C	I_{PK}	C
			$V_{M(AC)}$	$V_{M(DC)}$	W_{TM}	I_{TM}					
			(V)	(V)	(J)	(A)	(V)		(V)	(A)	(pF)
V39ZA6	14	39Z6	25	31	6	1000	35	43	76	10	6000
V39ZA20	20	39Z20	25	31	20	2000	35	43	76	20	12000
V47ZA05	5	Z47	30	38	0.4	100	42	55	93	1	400
V47ZA1	7	47Z1	30	38	1.8	250	42	52	93	2.5	800
V47ZA3	10	47Z3	30	38	4.5	500	42	52	93	5	2000
V47ZA7	14	47Z7	30	38	8.8	1000	42	52	93	10	4500
V47ZA20	20	47Z20	30	38	23	2000	42	52	93	20	11000
V56ZA05	5	Z56	35	45	0.5	100	50	66	110	1	360
V56ZA2	7	56Z2	35	45	2.3	250	50	62	110	2.5	700
V56ZA3	10	56Z3	35	45	5.5	500	50	62	110	5	1800
V56ZA8	14	56Z8	35	45	10	1000	50	62	110	10	3900
V56ZA20	20	56Z20	35	45	30	2000	50	62	110	20	10000
V68ZA05	5	Z68	40	56	0.6	100	61	80	135	1	300
V68ZA2	7	68Z2	40	56	3	250	61	75	135	2.5	600
V68ZA3	10	68Z3	40	56	6.5	500	61	75	135	5	1500
V68ZA10	14	68Z10	40	56	13	1000	61	75	135	10	3300
V68ZA20	20	68Z20	40	56	33	2000	61	75	135	20	10000
V82ZA05	5	Z82	50	68	2	400	73	97	135	5	240
V82ZA2	7	82Z2	50	68	4	1200	73	91	135	10	500
V82ZA4	10	82Z4	50	68	8	2500	73	91	135	25	1100
V82ZA12	14	82Z12	50	68	15	4500	73	91	145	50	2500
V100ZA05	5	Z100	60	81	2.5	400	90	117	165	5	180
V100ZA3	7	100Z	60	81	5	1200	90	110	165	10	400
V100ZA4	10	100Z4	60	81	10	2500	90	110	165	25	900
V100ZA15	14	100Z15	60	81	20	4500	90	110	175	50	2000
V120ZA05	5	Z120	75	02	3	400	108	138	205	5	140
V120ZA1	7	120Z	75	02	6	1200	108	132	205	10	300
V120ZA4	10	120Z4	75	02	12	2500	108	132	200	25	750
V120ZA6	14	120Z6	75	02	22	4500	108	132	210	50	1700

ZA SERIES (Continued)

ZA Series Varistors are listed under UL File No. E135010 as a UL recognized component.

(NOTE 1) MODEL NUMBER	MODEL SIZE DISC DIA. (mm)	DEVICE MARKING	MAXIMUM RATING (85°C)				SPECIFICATIONS (25°C)				
			CONTINUOUS		TRANSIENT		VARISTOR VOLTAGE AT 1mA DC TEST CURRENT		MAXIMUM CLAMPING VOLTAGE 8 x 20µs		TYPICAL CAPACITANCE f = 1MHz
			V_{RMS}	V_{DC}	ENERGY 10 x 1000µs	PEAK CURRENT 8 x 20µs	V_{NOM} MIN	V_{NOM} MAX	V_C	I_{PK}	C
			$V_{M(AC)}$	$V_{M(DC)}$	W_{TM}	I_{TM}					
			(V)	(V)	(J)	(A)	(V)		(V)	(A)	(pF)
V120ZA20	20	120Z20	75	02	33	6500	108	132	210	100	1500
V150ZA05	5	Z150	92	127	4	400	135	173	250	5	120
V150ZA1	7	Z051	95	127	8	1200	135	165	250	10	250
V150ZA4	10	150Z4	95	127	15	2500	135	165	250	25	600
V150ZA8	14	150Z8	95	127	20	4500	135	165	250	50	1400
V150ZA20	20	150Z20	95	127	45	6500	135	165	250	100	1000
V180ZA05	5	Z180	110	153	5	400	162	207	295	5	100
V180ZA1	7	180Z	115	153	10	1200	162	198	300	10	200
V180ZA5	10	180Z5	115	153	18	2500	162	198	300	25	500
V180ZA10	14	180Z10	115	153	35	4500	162	198	300	50	1100
V180ZA20	20	180Z20	115	153	52	6500	162	198	300	100	2400
V205ZA05	5	Z205	130	170	5.5	400	184	226	340	5	100
V220ZA05	5	Z220	140	180	6	400	198	253	360	5	90
V240ZA05	5	Z240	150	200	7	400	216	264	395	5	80
V270ZA05	5	Z270	175	225	7.5	400	243	311	455	5	70
V330ZA05	5	Z330	210	275	9	400	297	380	540	5	60
V360ZA05	5	Z360	230	300	9.5	400	324	396	595	5	55
V390ZA05	5	Z390	250	330	10	400	351	449	650	5	50
V430ZA05	5	Z430	275	369	11	400	387	495	710	5	45
V470ZA05	5	Z470	300	385	12	400	420	517	775	5	35
V620ZA05	5	Z620	385	505	13	400	558	682	1025	5	33
V680ZA05	5	Z680	420	560	14	400	610	748	1120	5	32
V715ZA05	5	Z715	440	585	15.5	400	643	787	1180	5	31
V750ZA05	5	Z750	460	615	17	400	675	825	1240	5	30

NOTES:

1. Average power dissipation of transients not to exceed 0.2W, 0.25W, 0.4W, 0.6W or 1W for model sizes 5mm, 7mm, 10mm, 14mm and 20mm, respectively.
2. Energy rating for impulse duration of 30ms minimum to one half of peak current.
3. 10mA DC test current.
4. Also rated to withstand 24V for 5 minutes.
5. Higher voltages available, contact Harris Semiconductor Power Marketing.

RA SERIES

Series RA8 Varistors of 130V_{RMS} or greater are listed under UL File No. E75961 as a recognized component. CSA approved File No. LR91788.

MODEL NUMBER	DEVICE MARKING	MAXIMUM RATINGS (+125°C)				SPECIFICATIONS (+25°C)					
		CONTINUOUS		TRANSIENT		VARISTOR VOLTAGE AT 1mA DC TEST CURRENT			MAX CLAMPING VOLTAGE V_C AT TEST CURRENT (8/20µs)		TYPICAL CAPACITANCE
		V_{RMS}	V_{DC}	ENERGY (10/1000µs)	PEAK CURRENT (8/20µs)	MIN	$V_{N(DC)}$	MAX	V_C	I_P	f = 1MHz
		$V_{M(AC)}$	$V_{M(DC)}$	W_{TM}	I_{TM}						
		(V)	(V)	(J)	(A)	(V)	(V)	(V)	(V)	(A)	(pF)
V8RA8	8R	4	5.5	0.4	150	6	8.2	11.2	22	5	3000
V12RA8	12R	6	8	0.6	150	9	12	16	34	5	2500
V18RA8	18R	10	14	0.8	250	14.4	18	21.6	42	5	2000
V22RA8	22R	14	18 (Note 3)	10 (Note 2)	250	18.7	22	26	47	5	1600
V27RA8	27R	17	22	1.0	250	23	27	31.1	57	5	1300
V33RA8	33R	20	26	1.2	250	29.5	33	36.5	68	5	1100
V39RA8	39R	25	31	1.5	250	35	39	43	79	5	900
V47RA8	47R	30	38	1.8	250	42	47	52	92	5	800
V56RA8	56R	35	45	2.3	250	50	56	62	107	5	700
V68RA8	68R	40	56	3.0	250	61	68	75	127	5	600
V82RA8	82R	50	66	4.0	1200	74	82	91	135	10	500
V100RA8	100R	60	81	5.0	1200	90	100	110	165	10	400
V120RA8	120R	75	102	6.0	1200	108	120	132	205	10	300
V150RA8	150R	95	127	8.0	1200	135	150	165	250	10	250
V180RA8	180R	115	153	10.0	1200	162	180	198	295	10	200
V200RA8	200R	130	175	11.0	1200	184	200	228	340	10	180
V220RA8	220R	140	180	12.0	1200	198	220	242	360	10	160
V240RA8	240R	150	200	13.0	1200	212	240	268	395	10	150
V270RA8	270R	175	225	15.0	1200	247	270	303	455	10	130
V360RA8	360R	230	300	20.0	1200	324	360	396	595	10	100
V390RA8	390R	250	330	21.0	1200	354	390	429	650	10	90
V430RA8	430R	275	369	23.0	1200	389	430	473	710	10	80

NOTES:

1. Average power dissipation of transients not to exceed 0.25W for RA8 Series.
2. Energy ratings for impulse duration of 30ms minimum to one half of peak current value.
3. Also rated to withstand 24V for 5 minutes.

LA SERIES

Series LA Varistors are listed under UL file #E75961 and E56529 as a recognized component.
Series LA Varistors are listed under CSA file #LR91788 as a recognized component.

MODEL NUMBER	MODEL SIZE DISC DIA. (mm)	DEVICE MARKING	MAXIMUM RATING (85°C)				SPECIFICATIONS (25°C)				
			CONTINUOUS		TRANSIENT		VARISTOR VOLTAGE AT 1mA DC TEST CURRENT		MAXIMUM CLAMPING VOLTAGE 8 x 20μs		TYPICAL CAPACI-TANCE f = 1MHz
			V_{RMS}	V_{DC}	ENERGY 10 x 1000μs	PEAK CURRENT 8 x 20μs					
			$V_{M(AC)}$	$V_{M(DC)}$	W_{TM}	I_{TM}	V_{NOM} MIN	V_{NOM} MAX	V_C	I_{PK}	C
			(V)	(V)	(J)	(A)	(V)		(V)	(A)	(pF)
V130LA1	7	1301	130	175	11	1200	184	255	390	10	180
V130LA2	7	1302	130	175	11	1200	184	228	340	10	180
V130LA5	10	1305	130	175	20	2500	184	228	340	25	450
V130LA10A	14	130L10	130	175	38	4500	184	228	340	50	1000
V130LA20A	20	130L20	130	175	70	6500	184	228	340	100	1900
V130LA20B	20	130L20B	130	175	70	6500	184	220	325	100	1900
V140LA2	7	1402	140	180	12	1200	198	242	360	10	160
V140LA5	10	1405	140	180	22	2500	198	242	360	25	400
V140LA10A	14	140L10	140	180	42	4500	198	242	360	50	900
V140LA20A	20	140L20	140	180	75	6500	198	242	340	100	1750
V150LA1	7	1501	150	200	13	1200	212	284	430	10	150
V150LA2	7	1502	150	200	13	1200	212	268	395	10	150
V150LA5	10	1505	150	200	25	2500	212	268	395	25	360
V150LA10A	14	150L10	150	200	45	4500	212	268	395	50	800
V150LA20A	20	150L20	150	200	80	6500	212	268	395	100	1600
V150LA20B	20	150L20B	150	200	80	6500	212	243	360	100	1600
V175LA2	7	1752	175	225	15	1200	247	303	455	10	130
V175LA5	10	1755	175	225	30	2500	247	303	455	25	350
V175LA10A	14	175L10	175	225	55	4500	247	303	455	50	700
V175LA20A	20	175L20	175	225	90	6500	247	303	455	100	1400
V230LA4	7	2304	230	300	20	1200	324	396	595	10	100
V230LA10	10	230L	230	300	35	2500	324	396	595	25	250
V230LA20A	14	230L20	230	300	70	4500	324	396	595	50	550
V230LA40A	20	230L40	230	300	122	4500	324	396	595	50	1100
V250LA2	7	2502	250	330	21	1200	354	473	730	10	90
V250LA4	7	2504	250	330	21	1200	354	429	650	10	90
V250LA10	10	250L	250	330	40	2500	354	429	650	25	220
V250LA20A	14	250L20	250	330	72	4500	354	429	650	50	500
V250LA40A	20	250L40	250	330	130	6500	354	429	650	100	1000
V250LA40B	20	250L40B	250	330	130	6500	354	413	620	100	1000
V275LA2	7	2752	275	369	23	1200	389	515	775	10	80
V275LA4	7	2754	275	369	23	1200	389	473	710	10	80
V275LA10	10	275L	275	369	45	2500	389	473	710	25	200
V275LA20A	14	275L20	275	369	75	4500	389	473	710	50	450
V275LA40A	20	275L40	275	369	140	6500	389	473	710	100	900
V275LA40B	20	275L40B	275	369	140	6500	389	453	680	100	900
V300LA2	7	3002	300	405	25	1200	420	565	870	10	70

LA SERIES (Continued)

Series LA Varistors are listed under UL file #E75961 and E56529 as a recognized component.
Series LA Varistors are listed under CSA file #LR91788 as a recognized component.

MODEL NUMBER	MODEL SIZE DISC DIA. (mm)	DEVICE MARKING	MAXIMUM RATING (85°C)				SPECIFICATIONS (25°C)				
			CONTINUOUS		TRANSIENT		VARISTOR VOLTAGE AT 1mA DC TEST CURRENT		MAXIMUM CLAMPING VOLTAGE 8 x 20μs		TYPICAL CAPACITANCE f = 1MHz
			V_{RMS}	V_{DC}	ENERGY 10 x 1000μs	PEAK CURRENT 8 x 20μs	V_{NOM} MIN	V_{NOM} MAX	V_C	I_{PK}	C
			$V_{M(AC)}$	$V_{M(DC)}$	W_{TM}	I_{TM}					
			(V)	(V)	(J)	(A)	(V)		(V)	(A)	(pF)
V300LA4	7	3004	300	405	25	1200	420	517	775	10	70
V300LA10	10	300L	300	405	46	2500	420	517	775	25	180
V300LA20A	14	300L20	300	405	77	4500	420	517	775	50	400
V300LA40A	20	300L40	300	405	165	6500	420	517	775	100	800
V320LA7	7	3207	320	420	25	1200	462	565	850	10	65
V320LA10	10	320L	320	420	48	2500	462	565	850	25	170
V320LA20A	14	320L20	320	420	80	4500	462	565	850	50	380
V320LA40B	20	320L40	320	420	150	6500	462	540	810	100	750
V385LA7	7	3857	385	505	27	1200	558	682	1025	10	60
V385LA10	10	385L	385	505	51	2500	558	682	1025	25	160
V385LA20A	14	385L20	385	505	85	4500	558	682	1025	50	360
V385LA40B	20	385L40	385	505	160	6500	558	682	1025	100	700
V420LA77	7	4207	420	560	30	1200	610	748	1120	10	55
V420LA10	10	420L	420	560	55	2500	610	748	1120	25	140
V420LA20A	14	420L20	420	560	90	4500	610	748	1120	50	300
V420LA40B	20	420L40	420	560	160	6500	610	720	1060	100	600
V460LA7	7	4607	460	615	37	1200	702	858	1130	10	55
V480LA7	7	4807	480	640	35	1200	670	825	1240	10	270
V480LA10	10	480L	480	640	60	2500	670	825	1240	25	120
V480LA40A	14	480L40	480	640	105	4500	670	825	1240	50	270
V480LA80B	20	480L80	480	640	180	6500	670	790	1160	100	550
V510LA10	10	510L	510	675	63	2500	735	910	1350	25	100
V510LA40A	14	510L40	510	675	110	4500	735	910	1350	50	250
V510LA80B	20	510L80	510	675	190	6500	735	860	1280	100	500
V575LA10	10	575L	575	730	65	2500	805	1000	1500	25	90
V575LA40A	14	575L40	575	730	120	4500	805	1000	1500	50	220
V575LA80B	20	575L80	575	730	220	6500	805	960	1410	100	450
V625LA10	10	625L	625	825	67	4500	940	1210	1820	25	80
V625LA40A	14	625L40	625	825	125	4500	940	1210	1820	50	210
V625LA80B	20	625L80	625	825	230	6500	940	1100	1650	100	425
V660LA10	10	660L	660	850	70	2500	940	1210	1820	50	70
V660LA50A	14	660L50	660	850	140	4500	940	1210	1820	50	200
V660LA100B	20	660L100	660	850	250	6500	940	1100	1650	100	400
V1000LA80A	14	1000L80	1000	1200	220	4500	1425	1800	2700	50	130
V1000LA160B	20	1000L160	1000	1200	360	6500	1425	1600	2420	100	250

NOTE: Average power dissipation of transients not to exceed 0.25W, 0.4W, 0.6W or 1W for model sizes 7mm, 10mm, 14mm and 20mm, respectively.

"C" III SERIES RATINGS

MODEL NUMBER	DEVICE MARKING	MAXIMUM RATINGS (+85°C)			
		CONTINUOUS	TRANSIENT		
		MAXIMUM V_{RMS} $V_{M(AC)}$ (V)	WITHSTANDING ENERGY (2ms) W_{TM} (⎍) (J)	PEAK CURRENT (8/20μs)	
				I_{TM1} 1 PULSE (A)	I_{TM2} 2 PULSES (A)
V130LA10C	130L10C	130	45	6000	5000
V130LA20C	130L20C	130	90	9000	7000
V130LA20CX325	130LA20CX325	130	90	9000	7000
V140LA10C	140L10C	140	50	6000	5000
V140LA20C	140L20C	140	100	9000	7000
V140LA20CX340	140L20CX340	140	100	9000	7000
V150LA10C	150L10C	150	55	6000	5000
V150LA20C	150L20C	150	110	9000	7000
V150LA20CX360	150L20CX360	150	110	9000	7000
V175LA10C	175L10C	175	60	6000	5000
V175LA20C	175L20C	175	120	9000	7000
V175LA20CX425	175L20CX425	175	120	9000	7000
V230LA20C	230L20C	230	80	6000	5000
V230LA40C	230L40C	230	160	9000	7000
V230LA40CX570	230L40X570	230	160	9000	7000
V250LA20C	250L20C	250	100	6000	5000
V250LA40C	250L40C	250	170	9000	7000
V250LA40CX620	250L40CX620	250	170	9000	7000
V275LA20C	275L20C	275	110	6000	5000
V275LA40C	275L40C	275	220	9000	7000
V275LA40CX680	275L40CX680	275	220	9000	7000
V300LA20C	300L20C	300	120	6000	5000
V300LA40C	300L40C	300	210	9000	7000
V300LA40CX745	300L40CX745	300	210	9000	7000
V320LA20C	320L20C	320	200	6000	5000
V320LA40C	320L40C	320	200	9000	7000

"C" III SERIES SPECIFICATIONS

MODEL NUMBER	MODEL SIZE DISC DIAMETER (mm)	SPECIFICATIONS (+25°C)					
		VARISTOR VOLTAGE AT 1mA DC TEST CURRENT		MAXIMUM CLAMPING VOLTAGE (8/20μs)		DUTY CYCLE SURGE RATING	
		V_N MIN (V)	V_N MAX (V)	V_C (V)	I_p (A)	3kA (8/20μs) # PULSES	750A (8/20μs) # PULSES
V130LA10C	14	184	228	340	50	10	80
V130LA20C	20	184	228	340	100	20	120
V130LA20CX325	20	184	220	325	100	20	120
V140LA10C	14	198	242	360	50	10	80
V140LA20C	20	198	242	360	100	20	120
V140LA20CX340	20	198	230	340	100	20	120
V150LA10C	14	212	268	395	50	10	80
V150LA20C	20	212	268	395	100	20	120
V150LA20CX360	20	212	243	360	100	20	120
V175LA10C	14	247	303	455	50	10	80
V175LA20C	20	247	303	455	100	20	120
V175LA20CX425	20	247	285	425	100	20	120

"C" III SERIES SPECIFICATIONS (Continued)

MODEL NUMBER	MODEL SIZE DISC DIAMETER (mm)	SPECIFICATIONS (+25°C)					
		VARISTOR VOLTAGE AT 1mA DC TEST CURRENT		MAXIMUM CLAMPING VOLTAGE (8/20μs)		DUTY CYCLE SURGE RATING	
		V_N MIN (V)	V_N MAX (V)	V_C (V)	I_p (A)	3kA (8/20μs) # PULSES	750A (8/20μs) # PULSES
V230LA20C	14	324	396	595	50	10	80
V230LA40C	20	324	396	595	100	20	120
V230LA40CX570	20	324	384	570	100	20	120
V250LA20C	14	354	429	650	50	10	80
V250LA40C	20	354	429	650	100	20	120
V250LA40CX620	20	354	413	620	100	20	120
V275LA20C	14	389	473	710	50	10	80
V275LA40C	20	389	473	710	100	20	120
V275LA40CX680	20	389	453	680	100	20	120
V300LA20C	14	420	517	775	50	10	80
V300LA40C	20	420	517	775	100	20	120
V300LA40CX745	20	420	480	745	100	20	120
V320LA20C	14	462	565	850	50	10	80
V320LA40C	20	462	565	850	100	20	120

NOTE: Average power dissipation of transients not to exceed 0.6W and 1W for model sizes 14mm and 20mm, respectively

MA SERIES

MODEL NUMBER	DEVICE MARKING	MAXIMUM RATINGS (+85°C)				SPECIFICATIONS (+25°C)				
		CONTINUOUS		TRANSIENT		VARISTOR VOLTAGE AT 1mA DC TEST CURRENT			MAX CLAMPING VOLT AT I_P VALUE CURRENT (8/20μs)	TYPICAL CAPACITANCE
		V_{RMS}	V_{DC}	ENERGY (10/1000μs)	PEAK CURRENT (8/20μs)					
		$V_{M(AC)}$	$V_{M(DC)}$	W_{TM}	I_{TM}	MIN	$V_{N(DC)}$	MAX	I_P = 2.0A	f = 1MHz
		(V)	(V)	(J)	(A)	(V)	(V)	(V)	(V)	(pF)
V18MA1A	18A	9	13	0.06	40	14	18	23	49	550
V18MA1B	18B	10	14	0.07	40	15	18	21	44	550
V18MA1S	18S	10	14	0.06	40	15	18	21	49	550
V22MA1A	22A	10	15	0.09	40	16	22	28	55	410
V22MA1B	22B	14	18	0.10	40	19	22	26	51	410
V22MA1S	22S	14	18	0.09	40	19	22	26	55	410
V27MA1A	27A	13	19	0.10	40	21	27	34	67	370
V27MA1B	27B	17	22	0.11	40	24	27	31	59	370
V27MA1S	27S	17	22	0.10	40	24	27	31	67	370
V33MA1A	33A	18	23	0.13	40	26	33	40	73	300
V33MA1B	33B	20	26	0.15	40	29.5	33	36.5	67	300
V33MA1S	33S	20	26	0.14	40	29.5	33	36.5	73	300
V39MA2A	39A	22	28	0.16	40	31	39	47	86	250
V39MA2B	39B	25	31	0.18	40	35	39	43	79	250
V39MA2S	39S	25	31	0.17	40	35	39	43	86	250
V47MA2A	47A	27	34	0.19	40	37	47	57	99	210
V47MA2B	47B	30	38	0.21	40	42	47	52	90	210
V47MA2S	47S	30	38	0.19	40	42	47	52	99	210
V56MA2A	56A	32	40	0.23	40	44	56	68	117	180
V56MA2B	56B	35	45	0.25	40	50	56	62	108	180
V56MA2S	56S	35	45	0.23	40	50	56	62	117	180

MA SERIES (Continued)

MODEL NUMBER	DEVICE MARKING	MAXIMUM RATINGS (+85°C)				SPECIFICATIONS (+25°C)				
		CONTINUOUS		TRANSIENT		VARISTOR VOLTAGE AT 1mA DC TEST CURRENT			MAX CLAMPING VOLT AT I_P VALUE CURRENT (8/20μs)	TYPICAL CAPACITANCE
		V_{RMS}	V_{DC}	ENERGY (10/1000μs)	PEAK CURRENT (8/20μs)	MIN	$V_{N(DC)}$	MAX	I_P = 2.0A	f = 1MHz
		$V_{M(AC)}$	$V_{M(DC)}$	W_{TM}	I_{TM}					
		(V)	(V)	(J)	(A)	(V)	(V)	(V)	(V)	(pF)
V68MA3A	68A	38	48	0.26	40	54	68	82	138	150
V68MA3B	68B	40	56	0.30	40	61	68	75	127	150
V68MA3S	68S	40	56	0.27	40	61	68	75	138	150
V82MA3A	82A	45	60	0.33	40	65	82	99	163	120
V82MA3B	82B	50	66	0.37	40	73	82	91	150	120
V82MA3S	82S	50	66	0.34	40	73	82	91	163	120
V100MA4A	100	57	72	0.40	40	80	100	120	200	100
V100MA4B	101	60	81	0.45	40	90	100	110	185	100
V100MA4S	102	60	81	0.42	40	90	100	110	200	100
V120MA1A	120	72	97	0.40	100	102	120	138	220	40
V120MA2B	121	75	101	0.50	100	108	120	132	205	40
V120MA2S	122	75	101	0.46	100	108	120	132	220	40
V150MA1A	150	88	121	0.50	100	127	150	173	255	32
V150MA2B	151	92	127	0.60	100	135	150	165	240	32
V180MA1A	180	105	144	0.60	100	153	180	207	310	27
V180MA3B	181	110	152	0.70	100	162	180	198	290	27
V220MA2A	220	132	181	0.80	100	187	220	253	380	21
V220MA4B	221	138	191	0.90	100	198	220	242	360	21
V270MA2A	270	163	224	0.90	100	229	270	311	460	17
V270MA4B	271	171	235	1.00	100	243	270	297	440	17
V330MA2A	330	188	257	1.00	100	280	330	380	570	14
V330MA5B	331	200	274	1.10	100	297	330	363	540	14
V390MA3A	390	234	322	1.20	100	331	390	449	670	12
V390MA6B	391	242	334	1.30	100	351	390	429	640	12
V430MA3A	430	253	349	1.50	100	365	430	495	740	11
V430MA7B	431	264	365	1.70	100	387	430	473	700	11

NOTE: Average power dissipation of transients not to exceed 200mW.

PA SERIES

Series PA Varistors are listed under UL file #E75961 and under CSA file #LR91788, as a UL recognized component.

MODEL NUMBER	MAXIMUM RATINGS (+85°C)				SPECIFICATIONS (+25°C)					
	CONTINUOUS		TRANSIENT		VARISTOR VOLTAGE AT 1mA DC TEST CURRENT			MAX CLAMPING VOLT V_C AT TEST CURRENT (8/20μs)		TYPICAL CAPACITANCE
	V_{RMS}	V_{DC}	ENERGY (10/1000μs)	PEAK CURRENT (8/20μs)	MIN	$V_{N(DC)}$	MAX	V_C	I_P	f = 1MHz
	$V_{M(AC)}$	$V_{M(DC)}$	W_{TM}	I_{TM}						
	(V)	(V)	(J)	(A)	(V)	(V)	(V)	(V)	(A)	(pF)
V130PA20A	130	175	70	6500	184	200	243	360	100	1900
V130PA20C	130	175	70	6500	184	200	220	325	100	1900
V150PA20A	150	200	80	6500	212	240	284	420	100	1600
V150PA20C	150	200	80	6500	212	240	243	360	100	1600
V250PA40A	250	330	130	6500	354	390	453	675	100	1000
V250PA40C	250	330	130	6500	354	390	413	620	100	1000

PA SERIES (Continued)

Series PA Varistors are listed under UL file #E75961 and under CSA file #LR91788, as a UL recognized component.

MODEL NUMBER	MAXIMUM RATINGS (+85°C)				SPECIFICATIONS (+25°C)					
	CONTINUOUS		TRANSIENT		VARISTOR VOLTAGE AT 1mA DC TEST CURRENT			MAX CLAMPING VOLT V_C AT TEST CURRENT (8/20μs)		TYPICAL CAPACITANCE
	V_{RMS}	V_{DC}	ENERGY (10/1000μs)	PEAK CURRENT (8/20μs)	MIN	$V_{N(DC)}$	MAX	V_C	I_P	f = 1MHz
	$V_{M(AC)}$	$V_{M(DC)}$	W_{TM}	I_{TM}						
	(V)	(V)	(J)	(A)	(V)	(V)	(V)	(V)	(A)	(pF)
V275PA40A	275	369	140	6500	389	430	494	740	100	900
V275PA40C	275	369	140	6500	389	430	453	680	100	900
V320PA40A	320	420	160	6500	462	510	565	850	100	750
V320PA40C	320	420	160	6500	462	510	540	800	100	750
V420PA40A	420	560	170	6500	610	680	790	1160	100	600
V420PA40C	420	560	170	6500	610	680	690	1050	100	600
V480PA80A	480	640	180	6500	670	750	860	1280	100	550
V480PA80C	480	640	180	6500	670	750	790	1160	100	550
V510PA80A	510	675	190	6500	735	820	963	1410	100	500
V510PA80C	510	675	190	6500	735	820	860	1280	100	500
V575PA80A	575	730	220	6500	805	910	1050	1560	100	450
V575PA80C	575	730	220	6500	805	910	960	1410	100	450
V660PA100A	660	850	250	6500	940	1050	1210	1820	100	400
V660PA100C	660	850	250	6500	940	1050	1100	1650	100	400

NOTE: Average power dissipation of transients not to exceed 1W.

CA SERIES

MODEL NUMBER	SIZE	MAXIMUM RATINGS (+85°C)				SPECIFICATIONS (+25°C)				
		CONTINUOUS		TRANSIENT		VARISTOR VOLTAGE AT 1mA DC TEST CURRENT			MAX CLAMPING VOLT V_C AT 200A CURRENT (8/20μs)	TYPICAL CAPACITANCE
		V_{RMS}	V_{DC}	ENERGY (2ms)	PEAK CURRENT (8/20μs)	MIN	$V_{N(DC)}$	MAX	V_C	f = 1MHz
		$V_{M(AC)}$	$V_{M(DC)}$	W_{TM}	I_{TM}					
	(mm)	(V)	(V)	(J)	(A)	(V)	(V)	(V)	(V)	(pF)
V131CA32	32	130	175	200	20000	184	200	228	350	4700
V131CA40	40			270	30000				345	10000
V151CA32	32	150	200	220	20000	212	240	268	410	4000
V151CA40	40			300	30000				405	8000
V251CA32	32	250	330	330	20000	354	390	429	680	2500
V251CA40	40			370	30000				650	5000
V251CA60	60			880	50000				620	10000
V271CA32	32	275	369	360	20000	389	430	473	750	2200
V271CA40	40			400	30000				730	4500
V271CA60	60			950	50000				680	9000
V321CA32	32	320	420	390	20000	462	510	539	850	1900
V321CA40	40			460	30000				830	3800
V321CA60	60			1100	50000				760	7500
V421CA32	32	420	560	400	25000	610	680	748	1200	1500
V421CA40	40			600	40000				1130	3000
V421CA60	60			1500	70000				1060	6000

CA SERIES (Continued)

MODEL NUMBER	SIZE	MAXIMUM RATINGS (+85°C)				SPECIFICATIONS (+25°C)				
		CONTINUOUS		TRANSIENT						
		V_{RMS}	V_{DC}	ENERGY (2ms)	PEAK CURRENT (8/20µs)	VARISTOR VOLTAGE AT 1mA DC TEST CURRENT			MAX CLAMPING VOLT V_C AT 200A CURRENT (8/20µs)	TYPICAL CAPACITANCE
		$V_{M(AC)}$	$V_{M(DC)}$	W_{TM}	I_{TM}	MIN	$V_{N(DC)}$	MAX	V_C	f = 1MHz
	(mm)	(V)	(V)	(J)	(A)	(V)	(V)	(V)	(V)	(pF)
V481CA32	32	480	640	450	25000	670	750	825	1300	1300
V481CA40	40			650	40000				1240	2700
V481CA60	60			1600	70000				1160	5500
V511CA32	32	510	675	500	25000	735	820	910	1440	1200
V511CA40	40			700	40000				1350	2500
V511CA60	60			1800	70000				1300	5000
V571CA32	32	575	730	550	25000	805	910	1000	1600	1100
V571CA40	40			770	40000				1480	2200
V571CA60	60			2100	70000				1420	4500
V661CA32	32	660	850	600	25000	940	1050	1160	1820	1000
V661CA40	40			900	40000				1720	2000
V661CA60	60			2300	70000				1640	4000
V751CA32	32	750	970	700	25000	1080	1200	1320	2050	800
V751CA40	40			1050	40000				2000	1800
V751CA60	60			2600	70000				1880	3500
V881CA60	60	880	1150	3200	70000	1290	1500	1650	2340	2700
V112CA60	60	1100	1400	3200	70000	1620	1800	2060	2940	2200
V142CA60	60	1400	1750	5000	70000	2020	2200	2550	3600	1800
V172CA60	60	1700	2150	6000	70000	2500	2700	3030	4300	1500
V202CA60	60	2000	2500	7500	70000	2970	3300	3630	5200	1200
V242CA60	60	2400	3000	8600	70000	3510	3900	4290	6200	1000
V282CA60	60	2800	3500	10000	70000	4230	4700	5170	7400	800

NOTE: Average power dissipation of transients not exceed 1.5W, 2.0W and 2.5W for model 32mm, 40mm and 60mm, respectively.

DA/DB SERIES

Series DA and DB Varistors are listed under UL file #E75961 as a UL recognized component.

MODEL NUMBER		MAXIMUM RATINGS (+85°C)				SPECIFICATIONS (+25°C)				
		CONTINUOUS		TRANSIENT						
		V_{RMS}	V_{DC}	ENERGY (2ms)	PEAK CURRENT (8/20µs)	VARISTOR VOLTAGE AT 1mA DC TEST CURRENT			MAX CLAMPING VOLT V_C AT 200A CURRENT (8/20µs)	TYPICAL CAPACITANCE
		$V_{M(AC)}$	$V_{M(DC)}$	W_{TM}	I_{TM}	MIN	$V_{N(DC)}$	MAX	V_C	f = 1MHz
DA	DB	(V)	(V)	(J)	(A)	(V)	(V)	(V)	(V)	(pF)
V131DA40	V131DB40	130	175	270	30000	184	200	228	345	10000
V151DA40	V151DB40	150	200	300	30000	212	240	268	405	8000
V251DA40	V251DB40	250	330	370	30000	354	390	429	650	5000
V271DA40	V271DB40	275	369	400	30000	389	430	473	730	4500
V321DA40	V321DB40	320	420	460	30000	462	510	539	830	3800
V421DA40	V421DB40	420	560	600	40000	610	680	748	1130	3000

DA/DB SERIES (Continued)

Series DA and DB Varistors are listed under UL file #E75961 as a UL recognized component.

MODEL NUMBER		MAXIMUM RATINGS (+85°C)				SPECIFICATIONS (+25°C)				
		CONTINUOUS		TRANSIENT		VARISTOR VOLTAGE AT 1mA DC TEST CURRENT			MAX CLAMPING VOLT V_C AT 200A CURRENT (8/20μs)	TYPICAL CAPACI-TANCE
		V_{RMS}	V_{DC}	ENERGY (2ms)	PEAK CURRENT (8/20μs)	MIN	$V_{N(DC)}$	MAX	V_C	f = 1MHz
DA	DB	$V_{M(AC)}$ (V)	$V_{M(DC)}$ (V)	W_{TM} (J)	I_{TM} (A)	(V)	(V)	(V)	(V)	(pF)
V481DA40	V481DB40	480	640	650	40000	670	750	825	1240	2700
V511DA40	V511DB40	510	675	700	40000	735	820	910	1350	2500
V571DA40	V571DB40	575	730	770	40000	805	910	1000	1480	2200
V661DA40	V661DB40	660	850	900	40000	940	1050	1160	1720	2000
V751DA40	V751DB40	750	970	1050	40000	1080	1200	1320	2000	1800

NOTE: Average power dissipation of transients not to exceed 2.0W.

HA SERIES

HA Series varistors are listed under CSA File #LR91788 as a recognized component.

HA Series varistors are listed under UL File #E75961 as a recognized component.

MODEL NUMBER	MAXIMUM RATINGS (+85°C)				SPECIFICATIONS (+25°C)				
	CONTINUOUS		TRANSIENT		VARISTOR VOLTAGE AT 1 mA DC TEST CURRENT			MAXIMUM CLAMPING VOLTAGE (V_C) AT 200A (8/20μs)	TYPICAL CAPACITANCE AT f = 1MHz
	V_{RMS}	V_{DC}	ENERGY (2ms)	PEAK CURRENT (8/20μs)	MIN	$V_{N(DC)}$	MAX	V_C	C
	$V_{M(AC)}$ (V)	$V_{M(DC)}$ (V)	W_{TM} ENERGY	I_{TM} (A)	(V)	(V)	(V)	(V)	(pF)
V131HA32	130	175	200	25000	184	200	228	350	4700
V131HA40	130	175	270	30000	184	200	228	345	10000
V151HA32	150	200	220	25000	212	240	268	410	4000
V151HA40	150	200	300	30000	212	240	268	405	8000
V251HA32	250	330	330	25000	354	390	429	650	2500
V251HA40	250	330	370	40000	354	390	429	630	5000
V271HA32	275	369	360	25000	389	430	473	710	2200
V271HA40	275	369	400	40000	389	430	473	690	4500
V321HA32	320	420	390	25000	462	510	539	845	1900
V321HA40	320	420	460	40000	462	510	539	825	3800
V421HA32	420	560	400	25000	610	680	748	1120	1500
V421HA40	420	560	600	40000	610	680	748	1100	3000
V481HA32	480	640	450	25000	670	750	825	1290	1300
V481HA40	480	640	650	40000	670	750	825	1230	2700
V511HA32	510	675	500	25000	735	820	910	1355	1200
V511HA40	510	675	700	40000	735	820	910	1295	2500
V571HA32	575	730	550	25000	805	910	1000	1570	1100
V571HA40	575	730	770	40000	805	910	1000	1480	2200
V661HA32	660	850	600	25000	940	1050	1160	1820	1000
V661HA40	660	850	900	40000	940	1050	1160	1720	2000
V751HA32	750	970	700	25000	1080	1200	1320	2050	800
V751HA40	750	970	1050	40000	1080	1200	1320	2000	1800

NA SERIES

MODEL NUMBER	SIZE (mm)	MAXIMUM RATINGS (+85°C)				SPECIFICATIONS (+25°C)				
		CONTINUOUS		TRANSIENT		VARISTOR VOLTAGE AT 1 mA DC TEST CURRENT			MAXIMUM CLAMPING VOLTAGE (Vc) AT 200A (8/20μs)	TYPICAL CAPACITANCE
		V_{RMS}	V_{DC}	ENERGY (2ms)	PEAK CURRENT (8/20μs)	MIN	$V_{N(DC)}$	MAX	V_C	f = 1MHz
		$V_{M(AC)}$	$V_{M(DC)}$	W_{TM}	I_{TM}					
		(V)	(V)	(V)	(A)	(V)	(V)	(V)	(V)	(pF)
V131NA34	34	130	175	270	30,000	184	200	228	345	10,000
V151NA34	34	150	200	300	30,000	212	240	268	405	8,000
V251NA34	34	250	330	370	40,000	354	390	429	650	5,000
V271NA34	34	275	369	400	40,000	389	430	473	730	4,500
V321NA34	34	320	420	460	40,000	462	510	539	830	3,800
V421NA34	34	420	560	600	40,000	610	680	748	1,130	3,000
V481NA34	34	480	640	650	40,000	670	750	825	1,240	2,700
V511NA34	34	510	675	700	40,000	735	820	910	1,350	2,500
V571NA34	34	575	730	770	40,000	805	910	1000	1,480	2,200
V661NA34	34	660	850	900	40,000	940	1050	1160	1,720	2,000
V751NA34	34	750	970	1050	40,000	1080	1200	1320	2,000	1,800

NOTE: Average power dissipation of transients not to exceed 2.0W.

BA/BB SERIES

Series BA and BB Varistors are listed under UL file #E75961 as a UL recognized component.

MODEL NUMBER	MAXIMUM RATINGS (+85°C)				CHARACTERISTICS (+25°C)				
	CONTINUOUS		TRANSIENT		VARISTOR VOLTAGE AT 1mA DC TEST CURRENT			MAX CLAMPING VOLT V_C AT 200A CURRENT (8/20μs)	TYPICAL CAPACITANCE
	V_{RMS}	V_{DC}	ENERGY (2ms)	PEAK CURRENT (8/20μs)	MIN	$V_{N(DC)}$	MAX	V_C	f = 1MHz
	$V_{M(AC)}$	$V_{M(DC)}$	W_{TM}	I_{TM}					
	(V)	(V)	(J)	(A)	(V)	(V)	(V)	(V)	(pF)
V131BA60	130	175	450	50000	184	200	228	340	20000
V151BA60	150	200	530	50000	212	240	268	400	16000
V251BA60	250	330	880	50000	354	390	429	620	10000
V271BA60	275	369	950	50000	389	430	473	680	9000
V321BA60	320	420	1100	50000	462	510	539	760	7500
V421BA60	420	560	1500	70000	610	680	748	1060	6000
V481BA60	480	640	1600	70000	670	750	825	1160	5500
V511BA60	510	675	1800	70000	735	820	910	1300	5000
V571BA60	575	730	2100	70000	805	910	1000	1420	4500
V661BA60	660	850	2300	70000	940	1050	1160	1640	4000
V751BA60	750	970	2600	70000	1080	1200	1320	1880	3500
V881BA60	880	1150	3200	70000	1290	1500	1650	2340	2700
V112BB60	1100	1400	3800	70000	1620	1800	2060	2940	2200
V142BB60	1400	1750	5000	70000	2020	2200	2550	3600	1800
V172BB60	1700	2150	6000	70000	2500	2700	3030	4300	1500

BA/BB SERIES (Continued)

Series BA and BB Varistors are listed under UL file #E75961 as a UL recognized component.

MODEL NUMBER	MAXIMUM RATINGS (+85°C)				CHARACTERISTICS (+25°C)				
	CONTINUOUS		TRANSIENT		VARISTOR VOLTAGE AT 1mA DC TEST CURRENT			MAX CLAMPING VOLT V_C AT 200A CURRENT (8/20μs)	TYPICAL CAPACITANCE
	V_{RMS}	V_{DC}	ENERGY (2ms)	PEAK CURRENT (8/20μs)	MIN	$V_{N(DC)}$	MAX	V_C	f = 1MHz
	$V_{M(AC)}$	$V_{M(DC)}$	W_{TM}	I_{TM}					
	(V)	(V)	(J)	(A)	(V)	(V)	(V)	(V)	(pF)
V202BB60	2000	2500	7500	70000	2970	3300	3630	5200	1200
V242BB60	2400	3000	8600	70000	3510	3900	4290	6200	1000
V282BB60	2800	3500	10000	70000	4230	4700	5170	7400	800

NOTE: Average power dissipation of transients not to exceed 2.5W. See Figures 3 and 4 for more information on power dissipation.

AS SERIES

+25°C Unless Otherwise Specified

PARAMETER	MODEL NUMBER								UNITS
	V302AS32	V402AS32	V502AS32	V602AS32	V302AS42	V402AS42	V502AS42	V402AS60	
Rated Voltage (RMS)	3.0	4.0	5.0	6.0	3.0	4.0	5.0	4.0	kV
Maximum Continuous Operating Voltage (MCOV)	2.55	3.40	4.25	5.1	2.55	3.40	4.25	3.40	kV
Reference Current, I_{REF}	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	mA
Minimum Reference Voltage, V_{REF}	3.1	4.1	5.1	6.1	3.1	4.1	5.1	4.1	kV_{RMS}
Nominal Discharge Current, I_P (8/20μs)	5.0	5.0	5.0	5.0	10.0	10.0	10.0	10.0	kA
Residual Voltage (max) at I_P	9.8	13.1	16.3	19.6	10.0	13.3	16.7	12.5	kV
Energy Rating at 60°C (2ms)	2.2	2.9	3.6	4.3	3.5	4.7	5.8	12.0	kJ
Peak Current, 4/10μs at 60°C (Note 2)	65.0	65.0	65.0	65.0	100.0	100.0	100.0	100.0	kA
Maximum Steep Current Residual Voltage at 5kA (1/20μs)	11.3	15.0	18.8	22.5	-	-	-	-	kV
Maximum Steep Current Residual Voltage at 10kA (1/20μs)	-	-	-	-	11.5	15.3	19.2	14.4	kV
Maximum Dissipation Power at MCOV	0.23	0.30	0.38	0.45	0.30	0.40	0.60	0.50	W
Maximum Conduction Current at MCOV	75.0	75.0	75.0	75.0	110.0	110.0	110.0	140.0	μA
DIMENSIONS (in millimeters)									
Diameter (ØD)									
Min	32.3	32.3	32.3	32.3	40.9	40.9	40.9	60.0	mm
Max	33.7	33.7	33.7	33.7	42.3	42.3	42.3	62.0	mm
Height (H)									
Typical	21.0	28.0	36.0	42.0	21.0	28.0	36.0	34.0	mm

NOTES:

1. In addition to above standard types, custom ratings and dimensions can be provided.
2. Parts should be wrapped using a secondary insulating film or encased by polymeric housing.

New Hi-Rel/Rad Hard Products

FRX130D, FRX130R, FRX130H
6A, 100V, 0.180Ω, N-CHANNEL

AnswerFAX Document # 3144

- Available in an LCC 18 Pin Ceramic Package
- Photo Current
  - 1.50nA per-RAD(Si)/sec Typically
- Neutron
  - Pre-RAD Specs for 3E13 Neutrons/cm^2
  - Usable to 3E14 Neutrons/cm^2

FRX9130D, FRX9130R, FRX9130H
3A, -100V, 0.550Ω, P-CHANNEL

AnswerFAX Document # 3656

- Available in an LCC 18 Pin Ceramic Package
- Photo Current
  - 1.50nA Per-RAD(Si)/sec Typically
- Neutron
  - Pre-RAD Specs for 3E13 Neutrons/cm^2
  - Usable to 3E14 Neutrons/cm^2

FRX234D, FRX234R, FRX234H
2.5A, 250V, 0.700Ω, N-CHANNEL

AnswerFAX Document # 3657

- Available in an LCC 18 Pin Ceramic Package
- Photo Current
  - 4.0nA Per-RAD(Si)/sec Typically
- Neutron
  - Pre-RAD Specs for 1E13 Neutrons/cm^2
  - Usable to 1E14 Neutrons/cm^2

HI-REL

- MOSFETs
  - TX, TXV
  - Rad Hard
- Bipolar Transistors
  - TX, TXV
  - MOVs

RADIATION HARDENED MOSFET

Features

- Total Dose
  - Meets Pre-Rad Specifications to 100KRAD(Si)
  - Defined End Point Specifications at 300KRAD(Si) and 1000KRAD(Si)
  - Performance Permits Limited Use to 3000KRAD(Si)
- Dose Rate
  - Survives 3E9RAD(Si)/sec at 80% BVDSS Typically
  - Survives 2E12 Typically if Current Limited to IDM
- Photo Current
  - 3.0nA Per-RAD(Si)/sec Typically
- Neutron
  - Pre-RAD Specifications for 1E13 Neutrons/cm^2
  - Usable to 1E14 Neutrons/cm^2

Description

The Harris Semiconductor Sector has designed a series of SECOND GENERATION hardened power MOSFETs of both N and P channel enhancement types with ratings from 100V to 500V, 1A to 60A, and on resistance as low as 25mΩ. Total dose hardness is offered at 100K RAD(Si) and 1000K RAD(Si) with neutron hardness ranging from 1E13n/cm^2 for 500V product to 1E14n/cm^2 for 100V product. Dose rate hardness (GAMMA DOT) exists for rates to 1E9 without current limiting and 2E12 with current limiting.

These MOSFETs are enhancement-mode silicon-gate power field effect transistors of the vertical DMOS (VDMOS) structure. They are specially designed and processed to exhibit minimal characteristic changes to total dose (GAMMA) and neutron (n^o) exposures. Design and processing efforts are also directed to enhance survival to dose rate (GAMMA DOT) exposure.

These parts may be supplied as dies or in various packages other than shown. Reliability screening is available as either non TX (commercial), TX equivalent of MIL-S-19500, TXV equivalent of MIL-S-19500, or space equivalent of MIL-S-19500. Contact the Harris Semiconductor High-Reliability Marketing group for any desired deviations from the devices listed.

Hi-Rel and Rad Hard Ordering Information

RADIATION HARDENED MOSFET NOMENCLATURE SYSTEM

FR X XXXX X X

HARRIS RADIATION HARDENED POWER MOSFET

PACKAGE DESIGNATION
- M: TO-204AA (TO-3 with 40 mil diameter leads)
- K: TO-204AE (TO-3 with 60 mil diameter leads)
- L: TO-205AF (TO-39 with Low Profile Cap)
- F: TO-254AA
- S: TO-257AA
- E: TO-258AA
- X: 18 Lead LCC

DIE DESIGNATION
All Numeric Characters
N-Channel (Three Digits) - XXX
P-Channel (Four Digits) - 9XXX

RADIATION (TOTAL DOSE) ASSURANCE LEVEL
- D: 10KRAD(Si)
- R: 100KRAD(Si)
- H: 1000KRAD(Si)

RELIABILITY SCREENING LEVEL
- 1: Non-TX (Commercial)
- 2: TX Equivalent of MIL-S-19500
- 3: TXV Equivalent of MIL-S-19500
- 4: Space Equivalent of MIL-S-19500

RADIATION HARDENED MOSFETS (N-CHANNEL)

DIE FAMILY	TO-3		TO-39		TO-254		TO-257		TO-258	
	INTERIM	FINAL	INTERIM	FINAL	INTERIM	FINAL	INTERIM	FINAL	INTERIM	FINAL
17631	FRM130D	2N7271	FRL130D	2N7272	-	-	FRS130D	2N7273	-	-
	FRM130R		FRL130R		-	-	FRS130R		-	-
	FRM130H		FRL130H		-	-	FRS130H		-	-
17632	FRM230D	2N7274	FRL230D	2N7275	-	-	FRS230D	2N7276	-	-
	FRM230R		FRL230R		-	-	FRS230R		-	-
	FRM230H		FRL230H		-	-	FRS230H		-	-
17633	FRM234D	2N7277	FRL234D	2N7278	-	-	FRS234D	2N7279	-	-
	FRM234R		FRL234R		-	-	FRS234R		-	-
	FRM234H		FRL234H		-	-	FRS234H		-	-
17635	FRM430D	2N7280	FRL430D	2N7281	-	-	FRS430D	2N7282	-	-
	FRM430R		FRL430R		-	-	FRS430R		-	-
	FRM430H		FRL430H		-	-	FRS430H		-	-
17641	FRM140D	2N7283	-	-	-	-	FRS140D	2N7284	-	-
	FRM140R		-	-	-	-	FRS140R		-	-
	FRM140H		-	-	-	-	FRS140H		-	-
17642	FRM240D	2N7285	-	-	-	-	FRS240D	2N7286	-	-
	FRM240R		-	-	-	-	FRS240R		-	-
	FRM240H		-	-	-	-	FRS240H		-	-

RADIATION HARDENED MOSFETS (N-CHANNEL) (Continued)

DIE FAMILY	TO-3		TO-39		TO-254		TO-257		TO-258	
	INTERIM	FINAL	INTERIM	FINAL	INTERIM	FINAL	INTERIM	FINAL	INTERIM	FINAL
17643	FRM244D	2N7287	-	-	-	-	FRS244D	2N7288	-	-
	FRM244R		-	-	-	-	FRS244R		-	-
	FRM244H		-	-	-	-	FRS244H		-	-
17645	FRM440D	2N7289	-	-	-	-	FRS440D	2N7290	-	-
	FRM440R		-	-	-	-	FRS440R		-	-
	FRM440H		-	-	-	-	FRS440H		-	-
17651	FRK150D	2N7291	-	-	FRF150D	2N7292	-	-	-	-
	FRK150R		-	-	FRF150R		-	-	-	-
	FRK150H		-	-	FRF150H		-	-	-	-
17652	FRK250D	2N7293	-	-	FRF250D	2N7294	-	-	-	-
	FRK250R		-	-	FRF250R		-	-	-	-
	FRK250H		-	-	FRF250H		-	-	-	-
17653	FRK254D	2N7295	-	-	FRF254D	2N7296	-	-	-	-
	FRK254R		-	-	FRF254R		-	-	-	-
	FRK254H		-	-	FRF254H		-	-	-	-
17655	FRM450D	2N7297	-	-	FRF450D	2N7298	-	-	-	-
	FRM450R		-	-	FRF450R		-	-	-	-
	FRM450H		-	-	FRF450H		-	-	-	-
17661	FRK160D	2N7299	-	-	-	-	-	-	FRE160D	2N7300
	FRK160R		-	-	-	-	-	-	FRE160R	
	FRK160H		-	-	-	-	-	-	FRE160H	
17662	FRK260D	2N7301	-	-	-	-	-	-	FRE260D	2N7302
	FRK260R		-	-	-	-	-	-	FRE260R	
	FRK260H		-	-	-	-	-	-	FRE260H	
17663	FRK264D	2N7303	-	-	-	-	-	-	FRE264D	2N7304
	FRK264R		-	-	-	-	-	-	FRE264R	
	FRK264H		-	-	-	-	-	-	FRE264H	
17665	FRK460D	2N7305	-	-	-	-	-	-	FRE460D	2N7306
	FRK460R		-	-	-	-	-	-	FRE460R	
	FRK460H		-	-	-	-	-	-	FRE460H	

NOTE: The reliability screening code has been omitted for convenience.

Pre-Post Radiation Characteristics

RADIATION HARDENED POWER MOSFETs (N-CHANNEL)

RATED BV_{DSS}	TYPE NUMBER	PACKAGE OUTLINE (TO-)	PRE-RADIATION RATINGS			POST 10K RAD OR POST 100K RAD (Si) RATINGS			POST 1M RAD (Si) RATINGS		
			I_D (A)	$r_{DS(ON)}$ (W)	$V_{GS(TH)}$ (V)	BV_{DSS} (V)	$r_{DS(ON)}$ (W)	$V_{GS(TH)}$ (V)	BV_{DSS} (V)	$r_{DS(ON)}$ (W)	$V_{GS(TH)}$ (V)
100	2N7271	204AA	14	0.180	2 - 4	100	0.180	2 - 4	95	0.270	1.5 - 4.5
100	2N7272	205AF	8	0.180	2 - 4	100	0.180	2 - 4	95	0.270	1.5 - 4.5
100	2N7273	257AA	12	0.195	2 - 4	100	0.195	2 - 4	95	0.293	1.5 - 4.5
100	2N7283	204AA	23	0.130	2 - 4	100	0.130	2 - 4	95	0.200	1.5 - 4.5
100	2N7284	257AA	17	0.145	2 - 4	100	0.145	2 - 4	95	0.218	1.5 - 4.5
100	2N7291	204AE	40	0.055	2 - 4	100	0.055	2 - 4	95	0.083	1.5 - 4.5
100	2N7292	254AA	25	0.070	2 - 4	100	0.070	2 - 4	95	0.105	1.5 - 4.5
100	2N7299	204AE	50	0.040	2 - 4	100	0.040	2 - 4	95	0.060	1.5 - 4.5
100	2N7300	258AA	41	0.050	2 - 4	100	0.050	2 - 4	95	0.075	1.5 - 4.5
200	2N7274	204AA	8	0.500	2 - 4	200	0.500	2 - 4	190	0.750	1.5 - 4.5
200	2N7275	205AF	5	0.500	2 - 4	200	0.500	2 - 4	190	0.750	1.5 - 4.5
200	2N7276	257AA	7	0.515	2 - 4	200	0.515	2 - 4	190	0.773	1.5 - 4.5
200	2N7285	204AA	16	0.240	2 - 4	200	0.240	2 - 4	190	0.360	1.5 - 4.5
200	2N7286	257AA	12	0.255	2 - 4	200	0.255	2 - 4	190	0.383	1.5 - 4.5
200	2N7293	204AE	27	0.100	2 - 4	200	0.100	2 - 4	190	0.140	1.5 - 4.5
200	2N7294	254AA	23	0.115	2 - 4	200	0.115	2 - 4	190	0.161	1.5 - 4.5
200	2N7301	204AE	46	0.070	2 - 4	200	0.070	2 - 4	190	0.105	1.5 - 4.5
200	2N7302	258AA	31	0.080	2 - 4	200	0.080	2 - 4	190	0.120	1.5 - 4.5
250	2N7277	204AA	7	0.700	2 - 4	250	0.700	2 - 4	238	1.000	1.5 - 4.5
250	2N7278	205AF	4	0.700	2 - 4	250	0.700	2 - 4	238	1.000	1.5 - 4.5
250	2N7279	257AA	5	0.715	2 - 4	250	0.715	2 - 4	238	1.070	1.5 - 4.5
250	2N7287	204AA	12	0.400	2 - 4	250	0.400	2 - 4	238	0.600	1.5 - 4.5
250	2N7288	257AA	9	0.415	2 - 4	250	0.415	2 - 4	238	0.623	1.5 - 4.5
250	2N7295	204AE	20	0.170	2 - 4	250	0.170	2 - 4	238	0.215	1.5 - 4.5
250	2N7296	254AA	17	0.185	2 - 4	250	0.185	2 - 4	238	0.234	1.5 - 4.5
250	2N7303	204AE	34	0.120	2 - 4	250	0.120	2 - 4	238	0.180	1.5 - 4.5
250	2N7304	258AA	23	0.130	2 - 4	250	0.130	2 - 4	238	0.195	1.5 - 4.5
500	2N7280	204AA	3	2.500	2 - 4	500	2.500	2 - 4	475	3.750	1.5 - 4.5
500	2N7281	205AF	2	2.500	2 - 4	500	2.500	2 - 4	475	3.750	1.5 - 4.5
500	2N7282	257AA	3	2.520	2 - 4	500	2.520	2 - 4	475	3.780	1.5 - 4.5
500	2N7289	204AA	6	1.400	2 - 4	500	1.400	2 - 4	475	2.100	1.5 - 4.5
500	2N7290	257AA	5	1.420	2 - 4	500	1.420	2 - 4	475	2.130	1.5 - 4.5
500	2N7297	204AA	10	0.600	2 - 4	500	0.600	2 - 4	475	0.860	1.5 - 4.5
500	2N7298	254AA	9	0.615	2 - 4	500	0.615	2 - 4	475	0.879	1.5 - 4.5
500	2N7305	204AE	17	0.400	2 - 4	500	0.400	2 - 4	475	0.600	1.5 - 4.5
500	2N7306	258AA	12	0.410	2 - 4	500	0.410	2 - 4	475	0.615	1.5 - 4.5

RADIATION HARDENED POWER MOSFETs (P-CHANNEL)

RATED BVDSS	TYPE NUMBER	PACKAGE OUTLINE (TO-)	PRE RADIATION RATINGS			POST 10K RAD OR POST 100K RAD (Si) RATINGS			POST 1M RAD (Si) RATINGS		
			I_D (A)	$r_{DS(ON)}$ (W)	$V_{GS(TH)}$ (V)	BV_{DSS} (V)	$r_{DS(ON)}$ (W)	$V_{GS(TH)}$ (V)	BV_{DSS} (V)	$r_{DS(ON)}$ (W)	$V_{GS(TH)}$ (V)
100	2N7307	204AA	6	0.550	2 - 4	100	0.550	2 - 4	95	0.830	2 - 6
100	2N7308	205AF	5	0.550	2 - 4	100	0.550	2 - 4	95	0.830	2 - 6
100	2N7309	257AA	6	0.565	2 - 4	100	0.565	2 - 4	95	0.848	2 - 6
100	2N7316	204AA	11	0.300	2 - 4	100	0.300	2 - 4	95	0.450	2 - 6
100	2N7317	257AA	11	0.315	2 - 4	100	0.315	2 - 4	95	0.473	2 - 6
100	2N7322	204AE	26	0.125	2 - 4	100	0.125	2 - 4	95	0.188	2 - 6
100	2N7323	254AA	23	0.140	2 - 4	100	0.140	2 - 4	95	0.210	2 - 6
100	2N7328	204AE	40	0.085	2 - 4	100	0.085	2 - 4	95	0.128	2 - 6
100	2N7329	258AA	30	0.095	2 - 4	100	0.095	2 - 4	95	0.143	2 - 6
200	2N7310	204AA	4	1.300	2 - 4	200	1.300	2 - 4	190	1.950	2 - 6
200	2N7311	205AF	3	1.300	2 - 4	200	1.300	2 - 4	190	1.950	2 - 6
200	2N7312	257AA	4	1.320	2 - 4	200	1.320	2 - 4	190	1.980	2 - 6
200	2N7318	204AA	7	0.720	2 - 4	200	0.720	2 - 4	190	1.080	2 - 6
200	2N7319	257AA	7	0.735	2 - 4	200	0.735	2 - 4	190	1.100	2 - 6
200	2N7324	204AA	16	0.300	2 - 4	200	0.300	2 - 4	190	0.450	2 - 6
200	2N7325	254AA	14	0.315	2 - 4	200	0.315	2 - 4	190	0.473	2 - 6
200	2N7330	204AE	26	0.200	2 - 4	200	0.200	2 - 4	190	0.300	2 - 6
200	2N7331	258AA	19	0.210	2 - 4	200	0.210	2 - 4	190	0.315	2 - 6

QPL APPROVED JANTX/TXV POWER MOSFETs

PART NUMBER	MIL-S-19500/	LEVEL		PACKAGE	P_T (W)	I_D (A)	BV_{DSS} (V)	$r_{DS(ON)}$ (Ω)
		TX	TXV					
N-CHANNEL TYPES								
2N6756	542	X	X	TO-204AA	75	14	100	0.18
2N6758	542	X	X	TO-204AA	75	9	200	0.4
2N6760	542	X	X	TO-204AA	75	5.5	400	1.0
2N6762	542	X	X	TO-204AA	75	4.5	500	1.5
2N6764	543	X	X	TO-204AE	150	38	100	0.055
2N6766	543	X	X	TO-204AE	150	30	200	0.085
2N6768	543	X	X	TO-204AA	150	14	400	0.3
2N6770	543	X	X	TO-204AA	150	12	500	0.4
2N6782	556	X	X	TO-205AF	15	3.5	100	0.6
2N6784	556	X	X	TO-205AF	15	2.25	200	1.5
2N6786	556	X	X	TO-205AF	15	1.25	400	3.6
2N6788	555	X	X	TO-205AF	20	6	100	0.3
2N6790	555	X	X	TO-205AF	20	3.5	200	0.8
2N6792	555	X	X	TO-205AF	20	2	400	1.8
2N6794	555	X	X	TO-205AF	20	1.5	500	3.0
2N6796	557	X	X	TO-205AF	25	8	100	0.18
2N6798	557	X	X	TO-205AF	25	5.5	200	0.4
2N6800	557	X	X	TO-205AF	25	3	400	1.0
2N6802	557	X		TO-205AF	25	2.5	500	1.5
2N7224	592	X	X	TO-254AA	150	34	180	0.07
2N7225	592	X	X	TO-254AA	150	27.4	200	0.1
2N7227	592	X	X	TO-254AA	150	14	400	0.315
2N7228	592	X	X	TO-254AA	150	12	500	0.415
N-CHANNEL LOGIC LEVEL TYPES								
2N6901	570	X	X	TO-205AF	8.33	1.69	100	1.4
2N6902	566	X	X	TO-204AA	12	75	100	0.2
2N6903	570	X		TO-205AF	8.33	0.98	200	3.65
2N6904	566	X		TO-204AF	75	8	200	0.65
P-CHANNEL TYPES								
2N6895	565	X	X	TO-205AF	8.33	1.5	100	3.65
2N6896	565	X		TO-204AA	60	6	100	0.6
2N6897	565	X	X	TO-204AA	100	12	100	0.3
2N6898	565	X	X	TO-204AE	150	25	100	0.2
2N6849	564	X	X	TO-205AF	25	6.5	100	0.3
2N6851	564	X	X	TO-205AF	25	4	200	0.8

QPL APPROVED JAN/JANTX/TXV POWER BIPOLAR TRANSISTORS

TYPE NUMBER	MIL-S-19500/	LEVEL			PACKAGE	BV_{CEO} (W)	I_{CE} (A)	TYPE
		JAN	TX	TXV				
NPN TYPES								
2N6283	504		X	X	TO-204AA	80	20	Darlington
2N6284	504		X	X	TO-204AA	100	20	Darlington
2N6306	498		X	X	TO-204AA	250	8	High Speed
2N6308	498		X	X	TO-204AA	350	8	High Speed
2N6383	523		X	X	TO-204AA	40	10	Darlington
2N6384	523		X	X	TO-204AA	60	10	Darlington
2N6385	523		X	X	TO-204AA	80	10	Darlington
2N6546	525		X	X	TO-204AA	300	15	High Speed
2N6547	525		X	X	TO-204AA	400	15	High Speed
2N6671	536		X	X	TO-204AA	300	5	High Speed
2N6673	536		X	X	TO-204AA	400	5	High Speed
2N6674	537		X	X	TO-204AA	300	10	High Speed
2N6675	537		X	X	TO-204AA	400	10	High Speed
2N6676	538		X	X	TO-204AA	300	15	High Speed
2N6678	538		X	X	TO-204AA	400	15	High Speed
PNP TYPES								
2N6286	505	X	X		TO-204AA	80	20	Darlington
2N6287	505	X	X	X	TO-204AA	100	20	Darlington
2N6648	527		X	X	TO-204AA	40	10	Darlington
2N6649	527	X	X	X	TO-204AA	60	10	Darlington

HIGH-RELIABILITY SERIES MECHANICAL AND ENVIRONMENTAL TESTING FOR AEROSPACE, MILITARY, AND HIGH-RELIABILITY APPLICATIONS

The high-reliability Harris varistor is the latest step in increased product performance and is available for applications requiring assurance levels consistent with military or other standards (MIL-STD-19500, MIL-S-750, Method 202).

This series of high-reliability varistors involves five categories:

1. DESC Qualified Parts List (QPL) MIL-R-83530. 4 types presently available.
2. DESC Source Control Drawings based on MIL-R-83530. 83 types presently available - ZA radial series and DB industrial series.
3. Harris high-reliability series offers TX equivalents. 29 types presently available.
4. Custom types processed to customer-specific requirements - (SCD) or to standard military flow.
5. All MOVs are inherently resistant to radiation: Electron, Neutron, Gamma.

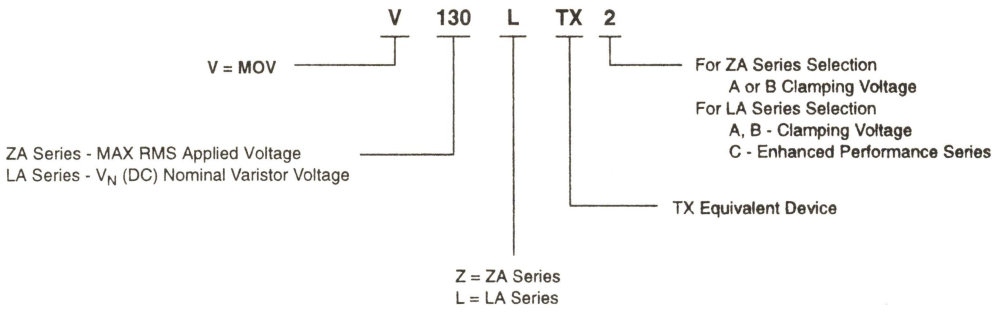
Credentials

Harris varistors and quality management systems are:

- DESC Approved
- QPL Listed
- CECC Approved
- ISO Approved
- UL Approved
- CSA Approved

Hi-Rel Varistors Ordering Information

MOV - HI-REL SERIES TX EQUIVALENT DEVICES



Hi-Rel Varistors Ratings and Characteristics

DESC Qualified Parts List (QPL) MIL-R-83530

MIL-R-83530/1

PART NUMBER M83530/	NOMINAL VARISTOR VOLTAGE (V)	TOLERANCE (%)	VOLTAGE RATING (V)		ENERGY RATING (J)	CLAMPING VOLTAGE AT 100A (V)	CAPACITANCE AT 1MHz (pF)	CLAMPING VOLTAGE AT PEAK CURRENT RATING (V)	I_{TM} (A)	NEAREST COMMERCIAL EQUIVALENT
			(RMS)	(DC)						
1-2000B	200	±10	130	175	50	325	3800	570	6000	V130LA20B
1-2200D	220	+10, -5	150	200	55	360	3200	650	6000	V150LA20B
1-4300E	430	+5, -10	275	369	100	680	1800	1200	6000	V275LA40B
1-5100E	510	+5, -10	320	420	120	810	1500	1450	6000	V320LA40B

This series of varistors are screened and conditioned in accordance with MIL-R-83530 as outlined in the table below. Manufacturing system conforms to MIL-I-45208; MIL-Q-9858.

MIL-R-83530 GROUP A, B, AND C INSPECTIONS

INSPECTION		AQL (PERCENT DEFECTIVE)	MAJOR	MINOR	NUMBER OF SAMPLE UNITS	FAILURES ALLOWED
Group A	SUBGROUP 1					
	High Temperature Life (Stabilization Bake)	100%	-	-	-	-
	Thermal Shock	100%	-	-	-	-
	Power Burn-In	100%	-	-	-	-
	Clamping Voltage	100%	-	-	-	-
	Nominal Varistor Voltage	100%	-	-	-	-
	SUBGROUP 2					
	Visual and Mechanical Examination	-	1.0% AQL 7.6% LQ	25% AQL 13.0% LQ	Per Plan	-
	Body Dimensions	-			Per Plan	-
	Diameter and Length of Leads	-			Per Plan	-
	Marking	-			Per Plan	-
	Workmanship	-			Per Plan	-
	SUBGROUP 3					
	Solderability	-	-	-	Per Plan	-
Group B	SUBGROUP 1					
	Dielectric Withstanding Voltage	-	-	-	Per Plan	-
	SUBGROUP 2					
	Resistance to Solvents	-	-	-	Per Plan	-
	SUBGROUP 3					
	Terminal Strength (Lead Fatigue)	-	-	-	Per Plan	-
	Moisture Resistance	-	-	-	Per Plan	-
	Peak Current	-	-	-	Per Plan	-
	Energy	-	-	-	Per Plan	-
Group C	EVERY 3 MONTHS					
	High Temperature Storage	-	-	-	10	0
	Operating Life (Steady State)	-	-	-	10	0
	Pulse Life	-	-	-	10	0
	Shock	-	-	-	10	0
	Vibration	-	-	-	10	0
	Constant Acceleration	-	-	-	10	0
	Energy	-	-	-	10	0

DESC Source Controlled Drawing # 87063

MIL-R-83530 ZA PACKAGE SERIES

87063 DASH NO.	NEAREST COMM. NO.	(NOTE 1) SIZE	MAXIMUM RATINGS (+85°C)				CHARACTERISTICS (+25°C)					
			CONTINUOUS		TRANSIENT		VARISTOR VOLTAGE at 1mA DC TEST CURRENT			MAXIMUM CLAMPING VOLTAGE V_C at TEST CURRENT (8/20μs)		TYPICAL CAPACITANCE
			RMS	DC	ENERGY (10/1000μs)	PEAK CURRENT (8/20μs)						
			$V_{M(AC)}$	$V_{M(DC)}$	W_{TM}	I_{TM}	MIN	$V_{N(DC)}$	MAX	V_C	I_C	f = 1MHz
			(V)	(V)	(J)	(A)	(V)	(V)	(V)	(V)	(A)	(pF)
001	V22ZA05	1	14	18	0.2	35	18.7	22	26	51	2	400
002	V22ZA1	2	14	18	0.9	150	18.7	22	26	47	5	1600
003	V22ZA2	3	14	18	2.0	350	18.7	22	26	43	5	4000
004	V22ZA3	4	14	18	4.0	750	18.7	22	26	43	10	9000
005	V24ZA50	5	14	18	6.5	1500	19.2	24 (Note 2)	26	43	20	18000
006	V27ZA05	1	17	22	0.25	35	23	27	31.1	59	2	300
007	V27ZA1	2	17	22	1.0	150	23	27	31.1	57	5	1300
008	V27ZA2	3	17	22	2.5	350	23	27	31.1	53	5	3000
009	V27ZA4	4	17	22	5.0	750	23	27	31.1	53	10	7000
010	V27ZA60	5	17	22	8.0	1500	23	27 (Note 2)	31.1	50	20	15000
011	V33ZA05	1	20	26	0.3	35	29.5	33	38	67	2	250
012	V33ZA1	2	20	26	1.2	150	29.5	33	36.5	68	5	1100
013	V33ZA2	3	20	26	3.0	350	29.5	33	36.5	64	5	2700
014	V33ZA5	4	20	26	6.0	750	29.5	33	36.5	64	10	6000
015	V33ZA70	5	21	27	9.0	1500	29.5	33 (Note 2)	36.5	58	20	13000
016	V36ZA80	5	23	31	10.0	1500	32	36 (Note 2)	40	63	20	12000
017	V39ZA05	1	25	31	0.35	35	35	39	46	79	2	220
018	V39ZA1	2	25	31	1.5	150	35	39	43	79	5	900
019	V39ZA3	3	25	31	3.5	350	35	39	43	76	5	2200
020	V39ZA6	4	25	31	7.2	750	35	39	43	76	10	5000
021	V47ZA05	1	30	38	0.4	35	42	47	55	90	2	200
022	V47ZA1	2	30	38	1.8	150	42	47	52	92	5	800
023	V47ZA3	3	30	38	4.5	350	42	47	52	89	5	2000
024	V47ZA7	4	30	38	8.8	750	42	47	52	89	10	4500
025	V56ZA05	1	35	45	0.5	35	50	56	66	108	2	180
026	V56ZA2	2	35	45	2.3	150	50	56	62	107	5	700

MIL-R-83530 ZA PACKAGE SERIES (Continued)

87063 DASH NO.	NEAREST COMM. NO.	(NOTE 1) SIZE	MAXIMUM RATINGS (+85°C)				CHARACTERISTICS (+25°C)					
			CONTINUOUS		TRANSIENT		VARISTOR VOLTAGE at 1mA DC TEST CURRENT			MAXIMUM CLAMPING VOLTAGE V_C at TEST CURRENT (8/20μs)		TYPICAL CAPACITANCE
			RMS	DC	ENERGY (10/1000μs)	PEAK CURRENT (8/20μs)						
			$V_{M(AC)}$	$V_{M(DC)}$	W_{TM}	I_{TM}	MIN	$V_{N(DC)}$	MAX	V_C	I_C	f = 1MHz
			(V)	(V)	(J)	(A)	(V)	(V)	(V)	(V)	(A)	(pF)
027	V56ZA3	3	35	45	5.5	350	50	56	62	103	5	1800
028	V56ZA8	4	35	45	10.0	750	50	56	62	103	10	3900
029	V68ZA05	1	40	56	0.6	35	61	68	80	127	2	150
030	V68ZA2	2	40	56	3.0	150	61	68	75	127	5	600
031	V68ZA3	3	40	56	6.5	350	61	68	75	123	5	1500
032	V68ZA10	4	40	56	13.0	750	61	68	75	123	10	3300
033	V82ZA05	1	50	66	1.2	70	73	82	97	145	2	120
034	V82ZA2	2	50	66	3.5	300	73	82	91	135	10	500
035	V82ZA4	3	50	66	7.3	750	73	82	91	135	25	1100
036	V82ZA12	4	50	66	13.0	1500	73	82	91	145	50	2500
037	V100ZA05	1	60	81	1.5	70	90	100	117	175	2	90
038	V100ZA3	2	60	81	4.3	300	90	100	110	165	10	400
039	V100ZA4	3	60	81	8.9	750	90	100	110	165	25	900
040	V100ZA15	4	60	81	16.0	1500	90	100	110	175	50	2000
041	V120ZA05	1	75	102	1.8	100	108	120	138	205	2	70
042	V120ZA1	2	75	102	5.3	400	108	120	132	205	10	300
043	V120ZA4	3	75	102	11.0	1000	108	120	132	200	25	750
044	V120ZA6	4	75	102	19.0	2000	108	120	132	210	50	1700
045	V150ZA05	1	92	127	2.3	100	135	150	173	240	2	60
046	V150ZA1	2	95	127	6.5	400	135	150	165	250	10	250
047	V150ZA4	3	95	127	13.0	1000	135	150	165	250	25	600
048	V150ZA8	4	95	127	23.0	2000	135	150	165	255	50	1400
049	V180ZA05	1	110	153	2.7	150	162	180	207	290	2	50
050	V180ZA1	2	115	153	7.7	500	162	180	198	295	10	200
051	V180ZA5	3	115	153	16.0	1500	162	180	198	300	25	500
052	V180ZA10	4	115	153	27.0	3000	162	180	198	300	50	1100

NOTES:

1. Size 1-5mm, 2-7mm, 3-10mm, 4-14mm, 5-20mm
2. Denotes 10mA DC test current.

DESC Standard Military Drawing # 90065

MIL-R-83530 DB PACKAGE SERIES

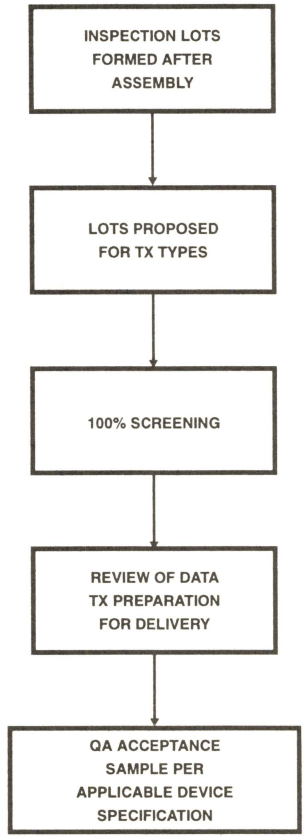
90065 DASH NO.	VOLTAGE RATING MAX (RMS)	ENERGY MAX (J)	PEAK CURRENT (A)	NOMINAL VARISTOR VOLTAGE (V)		MAX CLAMPING VOLTAGE AT TEST CURRENT		TYPICAL CAPACITANCE (pF)
						(V)	(I)	
012	130	170	22500	200	+28, -16	345	200	10000
013	150	200	22500	240	±28	405	200	8000
014	250	270	22500	390	+39, -36	650	200	5000
015	275	300	22500	430	±43	730	200	4500
016	320	350	22500	510	+29, -48	830	200	3800
017	420	460	28800	680	+68, -70	1130	200	3000
018	480	510	28800	750	+74, -80	1240	200	2700
019	510	550	28800	820	+91, -85	1350	200	2500
020	575	600	28800	910	+95, -105	1480	200	2200
021	660	690	28800	1050	±110	1720	200	2000
022	750	810	28800	1200	±120	2000	200	1800

Harris High Reliability Series TX Equivalents

TX MODEL TYPES

TX MODEL	MODEL SIZE	DEVICE MARK	NEAREST COMMERCIAL EQUIVALENT
V8ZTX1	7mm	8TX1	V8ZA1
V8ZTX2	10mm	8TX2	V8ZA2
V12ZTX1	7mm	12TX1	V12ZA1
V12ZTX2	10mm	12TX2	V12ZA2
V22ZTX1	7mm	22TX1	V22ZA1
V22ZTX3	14mm	22TX3	V22ZA3
V24ZTX50	20mm	24TX50	V24ZA50
V33ZTX1	7mm	33TX1	V33ZA1
V33ZTX5	14mm	33TX5	V33ZA5
V33ZTX70	20mm	33TX70	V33ZA70
V68ZTX2	7mm	68TX2	V68ZA2
V68ZTX10	14mm	68TX10	V68ZA10
V82ZTX2	7mm	82TX2	V82ZA2
V82ZTX12	14mm	82TX12	V82ZA12
V130LTX2	7mm	130TX	V130LA2
V130LTX10A	14mm	130TX10	V130LA10A
V130LTX20B	20mm	130TX20	V130LA20A
V150LTX2	7mm	150TX	V150LA2
V150LTX10A	14mm	150TX10	V150LA10A
V150LTX20B	20mm	150TX20	V150LA20B
V250LTX4	7mm	250TX	V250LA4
V250LTX20A	14mm	250TX20	V250LA20A
V250LTX40B	20mm	250TX40	V250LA40B
V420LTX20A	14mm	420TX20	V420LA20A
V420LTX40B	20mm	420TX40	V420LA40B
V480LTX40A	14mm	480TX40	V480LA40A
V480LTX80B	20mm	480TX80	V480LA80B
V510LTX40A	14mm	510TX40	V510LA40A
V510LTX80B	20mm	510TX80	V510LA80B

This series of varistors are 100% screened and conditioned in accordance with MIL-STD-750.



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Microcontrollers, Microprocessors, Memory and Peripherals

6805 8-BIT MICROCONTROLLER FAMILY

- Hardware
  - 8-Bit Architecture
  - Fully Static Operation
  - Self-Check Mode
  - Master Reset and Power-On Reset
  - Single 3V to 6V Power Supply
  - Power Saving Stop and Wait Modes
- Software
  - Software Compatible with Entire 6805 Family
  - 61 Instructions and 10 Addressing Modes
  - Indexed Addressing for Tables
  - True Bit Manipulation
  - Memory Mapped I/O
  - Efficient Use of Program Space
  - Versatile Interrupt Handling
- 8 x 8 Multiple Instruction in C4, C8 and D2 Versions

6805	68HC05	68HSC05	68HCL05
• 3µ • 4MHz	• 1.2µ • 4MHz • 6 Transistor RAM Cells	• 1.2µ • 8MHz • 6 Transistor RAM Cells	• 1.2µ • Low Power Version • 6 Transistor RAM Cells

BUS CONTROLLERS

- Generates all Control, Command, and Arbitration Signals for 80C86, 80C88, and 80C286
- 16-Bit, 4 Channel, 12.5MBit (Data Transfer Rate) DMA
- Services Prioritized Interrupts from Peripheral Components in Polled or Interrupt Driven Fashion

BUS DRIVERS, LATCHES

- Dual RS232 Transmitter/Receiver with Single +5V Supply
- Address, Data Bus Latch, Driver and Decoder Functions with Three-State Output Control
- 300pF Drive Capability
- Differential Driver/Receiver for Small Area Networks

CDP-1800 8-BIT MICROPROCESSORS MICROCOMPUTER FAMILY

- 7µ
- Fully Static Low Power CMOS
- Six Transistor RAM
- 16 x 16 Register Array for Use as Program Counters, Data Pointers, or Data Registers
- On Chip DMA, Interrupt, and Flag Inputs
- One Output and Four Input Bits

80C86, 80C88, 80C286 MICROPROCESSORS

- Pin and Function - Compatible with NMOS Equivalents
- Fully Static CMOS Designs
- Bus Hold Devices Eliminate Pull Up Resistors On Bus and Control Lines
- Available in /883 Compliant Versions

80C86	80C88	80C286
• 5MHz and 8MHz Commercial • 5MHz Military	• 5MHz and 8MHz Commercial • 5MHz Military	• 12.5MHz, 16MHz, 20MHz, and 25MHz Commercial • 10MHz and 12.5MHz Military

MEMORIES RAMs AND PROMs

- RAMs
  - Densities 1K-64K
  - Commercial - /883-DESC-JAN
  - Low Power CMOS
  - Six Transistor Arrays
- PROMs
  - 512 x 8, 2K x 8

PARALLEL I/O 4 - WIRE INTERFACE

- Programmable Parallel I/O Ports for Interfacing Peripheral Equipment to the Microprocessor System
- Provides Printer, Keyboard, and Display Interfaces

REAL-TIME CLOCK, CLOCK GENERATORS

- Keeps Track of Time From 1/100s to 128 Years
- Starts System or Application Programs at Specific Times
- Generates Clocks, Reset, and Synchronization for Processors and Peripherals
- Events can be Time and Date Stamped

TIMER, COUNTER, DISPLAY DRIVERS

- Generates Accurate Time Delays Under Software Control
- Provides Delay Timers, ÷ N Counters, Square Wave Generator, and Retriggerable One-Shot
- 10MHz Count Frequency
- 7, 14, and 16 Segment Display Drivers for LCD or LED Alphanumeric Displays
- 10 Digit or 8 Alphanumeric Character Display

SPECIAL FUNCTIONS

- Keyboard Encoders
  - 53 Key ASCII + 32 HEX
- SPI Bus Peripherals
  - 4 Wire 6805 SPI Serial Bus Peripherals (RAM, A/D, CLK, PWM, Port)
- Manchester Encoder Decoders
  - Bi-Phase Serial Data Protocol with Error Detection, Self Clocking and Bit Synchronization
  - Variable Data Length at 2.5MBits Per Second
  - No DC or Low Frequency Component Generated From Serial DATA
- ARINC Interface
  - ARINC Specification 429 Compatible
  - Dual Receiver, One Transmitter on One Chip
  - Up to 100K Bits Per Second

UARTS, BAUD RATE GENERATORS

- Full Duplex Serial Communication Channel Between Microprocessor and External Peripheral Equipment
- Parallel-to-Serial and Serial-to-Parallel Conversion of Data at 1M Baud Data Rate
- Programmable Work Length, Stop Bits, Parity, and Modem Controls
- Low Power Operation of 1mA, 1MHz

Microcontrollers, Microprocessors, Memory, and Peripherals Ordering Information

68HC05 MICROCONTROLLERS

CDP68HC05 E 1 X

- **FAMILY PART NUMBER**
- **PACKAGE DESIGNATION**
- **ELECTRICAL OPTION**
- **ENHANCED PRODUCT OPTION**

PACKAGE/OPTION	SUFFIX LETTER
Dual-In-Line Sidebrazed Ceramic DIP	D
Dual-In-Line Plastic DIP	E
Small Outline Plastic SOP	M
Plastic Leaded Chip Carrier PLCC	N
Metric Plastic Quad Flatpack MPQFP	Q
Chip (When Applicable)	H
Enhanced Product Screening i.e. Burn-In (Optional for D, E Package Types)	X
Electrical Option	1, 2, 4

80CXXX MICROPROCESSORS

M D 80C86 - 2 /B /883

TEMPERATURE RANGE
C: 0°C to +70°C
I: -40°C to +85°C
M: -55°C to +125°C
X: +25°C

PACKAGE
P: Plastic DIP
D: Ceramic DIP
X: Unpackaged Device
R: Leadless Chip Carrier
S: Plastic Leaded Chip Carrier
G: Pin Grid Array

PART NUMBER
80CXXX: CMOS Microprocessor
82CXXX: CMOS Peripherals

/883 CURRENT REV COMPLIANT

B: -55°C to -125°C with Burn-In

SPEED DESIGNATION

Peripherals	µProcessors
5: 5MHz	Blank: 5MHz
Blank: 8MHz	2: 8MHz
	-12: 12MHz
	-10: 10MHz
	-20: 20MHz
	-25: 25MHz

1800-SERIES MICROCONTROLLERS AND MICROCOMPUTERS

CDP1802AC E 1 X

- **PART NUMBER**
- **PACKAGE DESIGNATION**
- **ELECTRICAL OPTION**
- **ENHANCED-PRODUCT OPTION**

PACKAGE/OPTION	SUFFIX LETTER
Dual-In-Line Sidebrazed Ceramic DIP	D
Dual-In-Line Plastic DIP	E
Small Outline Plastic SOP	M
Plastic Leaded Chip Carrier PLCC	N
Metric Plastic Quad Flatpack MPQFP	Q
Chip (When Applicable)	H
Enhanced Product Screening i.e. Burn-In (Optional for D, E Package Types)	X
Single-In-Line Package (SIP)	Z

MEMORIES AND OTHER DIGITAL

H M 1 - 65162 B - 9

PREFIX
H (Harris)

FAMILY
M: Memory
D: Digital

PACKAGE
1: Ceramic DIP
1B: Brazed Seal
3: Plastic DIP
4: Leadless Carriers
5: Ceramic Substrate
6: Slimline
0: Chip Form

PART NUMBER

PERFORMANCE GRADE
B: High Performance
C: Relaxed Specification
X: Very High Speed

TEMPERATURE RANGE
6: 100% +25°C Probe (DICE Only)
8: -55°C to +125°C with Burn-In
9: -40°C to +85°C
/833: -55°C to +125°C; Fully Compliant to MIL-STD-883, Class B/QML

Synchronous
- Latched Address Bus
- Address must be Valid Prior to Chip Select

Asynchronous
- No Address Set Up Time

HIGH RELIABILITY 1800-SERIES MICROCONTROLLERS AND MICROCOMPUTERS

CDP1802 A C D /3

PART NUMBER

REVISION
A: 1st
B: 2nd etc.

VOLTAGE
C: 5V Device
NON-C: 10V Device

PACKAGE DESIGNATOR
D: Dual-In-Line
J: Leadless Chip Carrier

PRODUCT ASSURANCE LEVEL
3: Modified Class B

CA3000 LINEAR SERIES NOMENCLATURE GUIDE

CA3130 T 3

PART NUMBER
CAXXXX
HR3NXXX

PACKAGE DESIGNATOR
D: Dual-In-Line Metal-Seal Ceramic
F: Dual-In-Line Frit-Seal Ceramic
T: TO-5 Metal Can
S: DIL Formed TO-5
J: Leadless Chip Carrier

RELIABILITY SCREENING LEVEL
3: -55°C to +125°C Modified Class B
3W: Modified Class B without High & Low Temperature DC

NOTES:
1. Dual Gate FETs are in TO-72 packages.
2. CA3089F is screened to commercial limits only.

CDM, CDP, CMM, GP CMOS LSI NOMENCLATURE GUIDE

CDP1802 A C D 3

PART NUMBER
CDP18XX
CMMXXXX

REVISION
A: 1st
B: 2nd etc.

VOLTAGE
C: 5V Device
NON-C: 10V Device

PACKAGE DESIGNATOR
D: Dual-In-Line
J: Leadless Chip Carrier
K: Flatpack

PRODUCT ASSURANCE LEVEL
3: Modified Class B
IRZ: Modified Class S Rad Hard 10^5

Prefix Device Suffix

ICM 7170 A I D G

DEVICE FAMILY

BASIC DEVICE TYPE

ELECTRICAL OPTION

TEMPERATURE RANGE
C: Commercial, 0°C to +70°C
I: Industrial, -25°C to +85°C or -40°C to +85°C (Specified on Data Sheet)

PACKAGE
B: Small Outline, SOIC
D: Ceramic (Side-Brazed) Dual-In-Line
F: Ceramic Flatpack
I: 16 Pin (0.6 x 0.7 Pin Spacing) Hermetic Hybrid DIP
J: CerDIP Dual-In-Line
L: Leadless Ceramic Quad Pack
M: Plastic Quad Pack (PQFP)
P: Plastic Dual-In-Line
S: TO-52
T: TO-5 (Also TO-78, TO-99, TO-100)
U: TO-72 (Also TO-18, TO-71)
Z: TO-92
/W: Wafer
/D: DICE

NUMBER OF PINS
Pin Count Designators

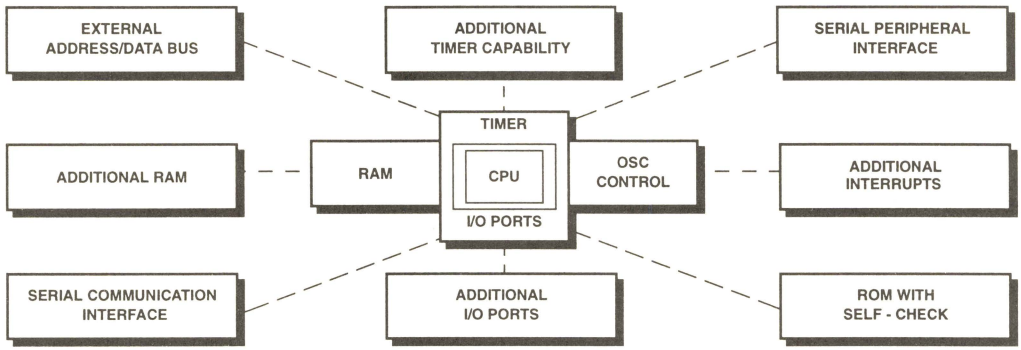
SUFFIX	NUMBER OF PINS
A	8
B	10
C	12
D	14
E	16
F	22
G	24
H	42
I	28
J	32
K	35
L	40
N	18
P	20
R	3
W	10 (0.230″ Pin Circle, Isolated Case)
44	44

Microcontrollers, Microprocessors, Memory and Peripheral Products

MICROCONTROLLERS

6805/68HC05 MICROCONTROLLER FAMILY

All members of the 6805 family are designed around a common core which consists of CPU, timer, oscillator, control, bidirectional I/O, RAM and ROM. This common core is expanded to provide versions of the 6805 with additional memory, I/O lines, interrupt capability, timer counters, and serial interfaces.



CDP6805 CMOS FAMILY CORE ARCHITECTURE BLOCK DIAGRAM

HARRIS 68HC05 QUICK REFERENCE

PART NUMBER	RAM BYTES	ROM BYTES	EXTERNAL ADDRESS SPACE	I/O LINES	FEATURES	ADDITIONAL FEATURES
CDP6805E2	112	-	8K	16	8-Bit Timer	• 8-Bit and 16-Bit Timers with Prescalers • UART • Serial Peripheral Interface (SPI) Provides Interface to Expanded Off Chip I/O • Keyboard Interfaces • Pulse Width Modulators • Watch Dog Timer • J1850
CDP6805E3	112	-	64K	13	8-Bit Timer	
CDP6805F2	64	1089	-	16	8-Bit Timer	
CDP6805G2	112	2106	-	32	8-Bit Timer Counter	
CDP68HC/HCL/HSC05C4	176	4160	-	24	16-Bit Timer, SCI, SPI	
CDP68HC/HCL/HSC05C8	176	7744	-	24	16-Bit Timer, SCI, SPI	
CDP68HC05D2	96	2176	-	28	16-Bit Timer, SPI	
CDP68HC05J3	128	2352	-	12	16-Bit Timer	
HIP7030AZ	176	2352	-	13	16-Bit Timer, SPI, J1850, Watchdog	
HIP7030A4	176	4160	-	13	16-Bit Timer, SPI, J1850, Watchdog	

MICROCONTROLLERS (Continued)

FEATURES	68HC05C4, 68HCL05C4 68HSC05C4			68HC05C8, 68HCL05C8 68HSC05C8			6805E2		6805E3		68HC05J3		HIP7030A2			HIP7030A4		
Technology	CMOS			CMOS			CMOS		CMOS		CMOS		CMOS			CMOS		
Package	E	Q	N	E	Q	N	E	Q	E	Q	E	M	E	M		E	M	
Pins	40	44	44	40	44	44	40	44	40	44	20	20	28	28		28	28	
On-Chip RAM (Bytes)	176			176			112		112		128		176			176		
External Address Space	-			-			8K		64K		-		-			-		
On-Chip User ROM (Bytes)	4160			7744			0		0		2352		2352			4160		
Bidirectional I/O Lines	24			24			16		13		12		13			13		
Unidirectional I/O Lines	7in			7in			0		0		-		-			-		
Memory Mapped I/O	Yes			Yes			Yes		Yes		Yes		Yes			Yes		
Timer Size (Bits)	16			16			8		8		16		16			16		
Prescaler Size (Bits)	Fixed as Divide by 4			Fixed as Divide by 4			7		7		Fixed 2		Fixed 2			Fixed 2		
Serial Peripheral Interface	Yes			Yes			No		No		No		Yes			Yes		
Serial Comm. Interface	Yes			Yes			No		No		No		No			No		
Keypad Scan Interface	No			No			No		No		Yes		No			No		
Interrupts	External, Timer			External, Timer			External, Timer		External, Timer		External, Timer		External, Timer			External, Timer		
↓	SCI	SWI	SPI	SCI	SWI	SPI	SWI		SWI		SWI	Port B	SWI	JPI	J1850	SWI	JPI	J1850
Watchdog Time	No			No			-		-		No		Yes			Yes		
8 x 8 Unsigned Mult. Instruct.	Yes			Yes			No		No		Yes		Yes			Yes		
Self-Check Mode	Yes			Yes			No		No		Yes		Yes			Yes		
Oscillator Mode	RC or Quartz			RC or Quartz			Quartz		Quartz		RC or Quartz		Quartz			Quartz		

FEATURES	68HC05C4, 68HC05C8	68HCL05C4, 68HCL05C8	68HSC05C4, 68HSC05C8	6805E2	6805E3
Typical Power Dissipation at T_A = +25°C Max Frequency and 5V: (HCL Shown at 2.4V and F_{OSC} = 1MHz)					
Run	17.5mW	1.2mW	33.5mW	35mW	35mW
Wait Mode	8.0mW	0.5mW	15mW	5mW	5mW
Stop Mode	10µW	<2.4µW	10µW	25µW	25µW

STATIC MICROPROCESSORS

80C286

- Compatible with NMOS 80286
- Static CMOS Design for Low Power Operation
  - ICCSB . . . . . 5mA Max
  - ICCOP . . . . . 220mA Max (80C286-12)
- High Performance Processor (Up to 19 Times the Throughput 8086)
- Large Address Space
  - 16M Bytes Physical
  - 1G Byte Virtual per Task
- Integrated Memory Management, Four-Level Memory Protection and Support for Virtual Memory and Operating Systems
- Two 80C286 Real Address Mode
  - 80C286 Real Address Mode
  - Protected Virtual Address Mode
- Compatible with 80287 Numberic Data Co-Processor
- Wide Range of Clock Rates
  - DC to 25MHz (80C286-25)
  - DC to 20MHz (80C286-20)
  - DC to 16MHz (80C286-16)
  - DC to 12.5MHz (80C286-12)
  - DC to 10MHz (80C286-10)
- High Bandwidth Bus Interface (25M Byte/s)
- Available in a 68 Lead PGA and PLCC

80C86

- Compatible with NMOS 8086
- Completely Static CMOS Design
  - DC to 5MHz (80C86)
  - DC to 8MHz (80C86-2)
- Low Power Operation
  - ICCSB . . . . . 500µA Max
  - ICCOP . . . . . 10mA/MHz (Typ)
- 1M Byte of Direct Memory Addressing Capability
- 24 Operand Addressing Modes
- Bit, Byte, Work and Block Move Operations
- 8-Bit and 16-Bit Signed/Unsigned Arithmetic
- Bus Hold Circuitry Eliminates Pull-Up Resistors
- Available in 40 Lead DIP and 40 Lead PLCC/LCC

80C88

- Compatible with NMOS 8088
- Direct Software Compatibility with 80C86, 8086, 8088
- 8-Bit Data Bus Interface: 16-Bit Internal Architecture
- Completely Static CMOS Design
  - DC to 5MHz (80C86)
  - DC to 8MHz (80C86-2)
- Low Power Operation
  - ICCSB . . . . . 500µA Max
  - ICCOP . . . . . 10mA/MHz (Typ)
- 1M Byte of Direct Memory Addressing Capability
- 24 Operand Addressing Modes
- Bit, Byte, Work and Block Move Operations
- 8-Bit and 16-Bit Signed/Unsigned Arithmetic
- Bus Hold Circuitry Eliminates Pull-Up Resistors
- Available in 40 Lead DIP and 40 Lead PLCC/LCC

MICROPROCESSORS AND MICROCOMPUTERS

CDP1800 SERIES

- 16 x 16 Matrix of Registers for Use as Multiple Program Counters, Data Pointers or Data Registers
- Single-Phase Clock; Optional On-Chip Crystal-Controlled Oscillator
- Flexible Programmed I/O Mode
- Four Flag Inputs Directly Tested by Branch Instructions
- Programmable Single-Bit Output Port
- Static Circuitry - No Minimum Clock Frequency
- 8-Bit Parallel Organization with Bidirectional Data Bus and Multiplexed Address Bus

CDP1800 SERIES SPECIFICATIONS

TYPE	MEMORY ADD (BYTES)	ON-CHIP RAM (BYTES)	ON-CHIP ROM (BYTES)	MAX CLK FREQ (MHz)	INSTRUC TIME MIN/MAX (µs)	TIMER/COUNTER BITS	PRESCALERS	BUS STRUCTURE	INTERRUPTS	LATCH I/O	MAX OPERATING TEMP (°C)	PACKAGE NUMBER OF LEADS	INSTRUCTIONS	ADDITIONAL FEATURES
CDP1802A CDP1802AC	64K	-	-	3.2	5.0/7.5	-	-	MUX Address Lines	X	Off-Chip	-55°C to +125°C	40D 40E 44Q	91	
CDP1802BC	64K	-	-	5.0	3.2/4.8	-	-	MUX Address Lines	X	Off-Chip	-55°C to +125°C	40D 40E 44Q	91	
CDP1805AC	64K	64	-	5.0	3.2/16.5	8	÷32	MUX Address Lines	X	Off-Chip	-55°C to +125°C	40D 40E 44Q	123 Includes Call/Return	8-Bit Timer/ Counter
CDP1806AC	64K	-	-	5.0	3.2/16.0	8	÷32	MUX Address Lines	X	Off-Chip	-55°C to +125°C	40D 40E 44Q	123 Includes Call/Return	8-Bit Timer/ Counter

MANCHESTER ENCODERS/DECODERS

HD-6408, HD-6409, HD-15530, HD-15531
CMOS MANCHESTER ENCODER/DECODER

AnswerFAX Document # 2952

Manchester (Bi-Phase) encoding and decoding of a serial data stream intended to service the requirements of MIL-STD-1553 and similar Manchester II self clocking, encoded, time division multiplexed serial data protocols.

- Independent Encoder and Decoder
- No DC Component Allowing Transformer Coupling
- High Noise Immunity
- Complete Clock Recovery and Phase Lock-in
- Encoder Converts NRZ Data to Manchester II Data Adding a Command or Data Synchronous Pulse and Parity (6408, 15530, 15531)
- Encoder Converts NRZ Data to Manchester II Data Adding Eight Manchester Zeroes and a Command Synchronous Pulse (6409)
- Decoder Recognizes Synchronous Pulse as a Command or Data Synchronous, Decodes the Data into NRZ, Checks for Parity (Except 6409), and Checks for Manchester Errors
- On-Chip Oscillator (6409 Only)
- Repeater Mode Reconstructs Manchester Code Input with a Recovered Clock (6409 Only)
- Applications
  - Military Aircraft Data Bus Standard
  - Telemetry Systems
  - Magnetic Tape Recording
  - Fiber Optic Communications
  - Security Systems
  - High Speed Modems

PART NUMBER	PIN CONFIGURATION	DATA FRAME LENGTH	DATA RATE	TEMPERATURE RANGE
HD-6408	24 Lead	16 Bits	1.0M Bit/s	-40°C to +85°C
HD-15530	24 Lead	16 Bits	1.25M Bit/s	-40°C to +85°C -55°C to +125°C
HD-15531	40 Lead	2-32 Bits	1.25M Bit/s	-40°C to +85°C -55°C to +125°C
HD-15531B	40 Lead	2-32 Bits	2.5M Bit/s	-40°C to +85°C -55°C to +125°C
HD-6409	20 Lead	Complete Variable	1.0M Bit/s	-40°C to +85°C -55°C to +125°C

CDP1871A, CDP1871AC
CMOS KEYBOARD ENCODER

AnswerFAX Document # 1374

- Directly Interfaces with CDP1800-Series Microprocessor
- Low Power Dissipation
- Three-State Outputs
- Scans and Generates Code for 53 Key ASCII Keyboard Plus 32 HEX Keys (SPST Mechanical Contact Switches)
- Shift, Control, and Alpha Lock Input
- RC-Controlled Debounce Circuitry
- Single Supply 4V to 10.5V. . . . . (CDP1871A)
  4V to 6.5V . . . . . (CDP1871AC)
- N-Key Lockout

BUS CONTROLLERS

82C59A
CMOS PRIORITY INTERRUPT CONTROLLER

AnswerFAX Document # 2784

- 12.5MHz, 8MHz and 5MHz Versions Available
- High Speed, "No Wait-State" Operation with 12.5MHz 80C286 and 8MHz 80C86/88
- Pin Compatible with NMOS 8259A
- 80C86/88/286 and 8080/85/86/88/286 Compatible
- Eight-Level Priority Controller, Expandable to 64 Levels
- Programmable Interrupt Modes
- Individual Request Mask Capability
- Fully Static Design
- Fully TTL Compatible
- Low Power Operation
  - ICCSB . . . . . .20μA (Max)
  - ICCOP . . . . . 1mA/MHz (Max)
- Single 5V Power Supply

82C37A
CMOS HIGH PERFORMANCE PROGRAMMABLE DMA CONTROLLER

AnswerFAX Document # 2967

- Compatible with the NMOS 8237A
- Four Independent Maskable Channels with Autoinitialization Capability
- Cascadable to any Number of Channels
- High Speed Data Transfers:
  -Up to 4MBytes/sec with 8MHz Clock
  -Up to 6.25MBytes/sec with 12.5MHz Clock
- Memory-to-Memory Transfers
- Static CMOS Design Permits Low Power Operation
  -ICCSB = 10μA Maximum
  -ICCOP = 2mA/MHz Maximum
- Fully TTL/CMOS Compatible
- Internal Registers may be Read from Software

82C89
CMOS BUS ARBITER

AnswerFAX Document # 2980

- Pin Compatible with Bipolar 8289
- Performance Compatible with:
  - 80C86/80C88 . . . . . .(5/8MHz)
- Provides Multi-Master System Bus Control and Arbitration
- Provides Simple Interface with 82C88/8288 Bus Controller
- Synchronizes 80C86/8086, 80C88/8088 Processors with Multi-Master Bus
- Bipolar Drive Capability
- Four Operating Modes for Flexible System Configuration
- Low Power Operation
  - ICCSB . . . . . .10μA (Max)
  - ICCOP . . . . . 1mA/MHz (Max)

82C88
CMOS BUS CONTROLLER

AnswerFAX Document # 2979

- Compatible with Bipolar 8288
- Performance Compatible with:
  - 80C86/80C88, 8086/8088 . . . . . (5/8MHz)
  - 80186/80188 . . . . . (6/8MHz)
  - 8089
- Provides Advanced Commands for Multi-Master Busses
- Three-State Command Outputs
- Bipolar Drive Capability
- Scaled SAJI IV CMOS Process
- Single 5V Power Supply
- Low Power Operation
  - ICCSB . . . . . 10μA (Max)
  - ICCOP . . . . . 1mA/MHz (Max)

CDP1877, CDP1877C
PROGRAMMABLE INTERRUPT CONTROLLER (PIC)

AnswerFAX Document # 1319

- Compatible with CDP1800 Series
- Programmable Long Branch Vector Address and Vector Interval
- 8 Levels of Interrupt Per Chip
- Easily Expandable
- Latched Interrupt Requests
- Hard Wired Interrupt Priorities
- Memory Mapped
- Multiple Chip Select Inputs to Minimize Address Space Requirements

CLOCK GENERATORS

82C84A CMOS CLOCK GENERATOR DRIVER

AnswerFAX Document # 2974

- Generates the System Clock for CMOS or NMOS Microprocessors
- Up to 25MHz Operation
- Uses a Parallel Mode Crystal Circuit or External Frequency Source
- Provides Ready Synchronization
- Generates System Reset Output from Schmitt Trigger Input
- TTL Compatible Inputs/Outputs
- Very Low Power Consumption
- Single 5V Power Supply
- Operating Temperature Ranges
  - C82C84A . . . . . 0°C to +70°C
  - I82C84A . . . . . -40°C to +85°C
  - M82C84A . . . . . -55°C to +125°C
- Application
  - System/Peripheral Clock Generator

82C284 CLOCK GENERATOR AND READY INTERFACE FOR 80C286 PROCESSORS

AnswerFAX Document # 2966

- Generates System Clock for 80C286 Processors
- Generates System Reset Output from Schmitt Trigger Input
- Improved Hysteresis
- Uses Crystal or External Signal for Frequency Source
- Dynamically Switchable between Two Input Frequencies
- Provides Local $\overline{\text{READY}}$ and MULTIBUS® $\overline{\text{READY}}$ Synchronization
- Static CMOS Technology
- Single +5V Power Supply
- Available in 18 Lead CerDIP Package
- Applications
  - System/Peripheral Clock Generator
  - Multibus Clock Generator/Synchronous

82C85 CMOS STATIC CLOCK CONTROLLER/GENERATOR

AnswerFAX Document # 2976

- Generates the System Clock for CMOS or NMOS Microprocessors and Peripherals
- Complete Control Over System Operation for Very Low System Power
  - Stop-Oscillator
  - Low Frequency
  - Stop-Clock
  - Full Speed Operation
- DC to 25MHz Operation (DC to 8MHz System Clock)
- Generates 50% and 33% Duty Cycle Clocks (Synchronized)
- Uses a Parallel Mode Crystal Circuit or External Frequency Source
- TTL Compatible Inputs/Outputs
- 24 Lead Slimline Dual-In-Line or 28 Pad Square LCC Package Options
- Single 5V Power Supply
- Operating Temperature Range
  - C82C85 . . . . . 0°C to +70°C
  - I82C85 . . . . . -40°C to +85°C
  - M82C85 . . . . . -55°C to +125°C
- Applications
  - System/Peripheral Clock Generator
  - System Power Control

TIMEBASE GENERATORS

ICM7207, ICM7207A TIMEBASE GENERATOR

AnswerFAX Document # 3163

- Oscillator and Frequency Divider Providing 4 Control Outputs for Frequency Counter Timebases
- Low Power Dissipation of <2mW
- Counter Outputs of $\div 2^{12}$, $\div 2^{n}$, $\div(2^{n} \times 10)$
- Low Impedance Output Drivers ≤100
- 10MHz, 1PPM/V Frequency Range
- Applications
  - System Timebases
  - Frequency Counters
  - Calibration Generators

ICM7209 TIMEBASE GENERATOR

AnswerFAX Document # 3175

- Oscillator Clock Generator with Two Outputs
- Disable Controls for Both Outputs
- 10MHz, 50mW Frequency Range
- 5X TTL Fanout with 10ns Rise/Fall Time
- Applications
  - Oscillator Clock Circuit

ICM7213 ONE SECOND/ONE MINUTE TIMEBASE GENERATOR

AnswerFAX Document # 3165

- Guaranteed 2V Operation
- Very Low Current Consumption: Typ 100µA at 3V
- All Outputs TTL Compatible
- On Chip Oscillator Feedback Resistor
- Oscillator Requires Only 3 External Components: Fixed Capacitor, Trim Capacitor, and a Quartz Crystal
- Output Inhibit Function
- 4 Simultaneous Outputs: One Pulse/Sec, One Pulse/Min, 16Hz and Composite 1024 + 16 + 2Hz Outputs
- Test Speed-Up Provides Other Frequency Outputs
- Applications
  - Real Time Clock Generator
  - System Timebase

BUS DRIVERS/LATCHES

82C82 - CMOS OCTAL LATCHING BUS DRIVER 82C83H - CMOS OCTAL LATCHING INVERTING BUS DRIVER

AnswerFAX Document # 2975

- Full 8-Bit Parallel Latching Buffer
- 82C82 is Bipolar 8282 Compatible
- 82C83H Bipolar 8283 Compatible
- Three-State Non-Inverting Outputs
- Gated Inputs:
  - Reduce Operating Power
  - Eliminate the Need for Pull-Up Resistors
- Single 5V Power Supply
- Low Power Operation . . . . . ICCSB = 10µA
- Operating Temperature Ranges
  - C82C82, C82C83H . . . . . 0°C to +70°C
  - I82C82, I82C83H . . . . . -40°C to +85°C
  - M82C82, M82C83H . . . . . -55°C to +125°C

82C86H - CMOS OCTAL BUS TRANSCEIVER 82C87H - CMOS OCTAL INVERTING BUS TRANSCEIVER

AnswerFAX Document # 2977

- Full 8-Bit Bi-directional Bus Interface
- Industry Standard 8286 Compatible Pinout
- High Drive Capability
  - B Side IOL 20mA
  - A Side IOL 12mA
- Three-State Outputs
- Propagation Delay. . . . . 35ns Max.
- Gated Inputs
  - Reduce Operating Power
  - Eliminate the Need for Pull-Up Resistors
- Single 5V Power Supply
- Low Power Operation . . . . . ICCSB = 10µA
- Operating Temperature Ranges
  - C82C86H, C82C87H. . . . . 0°C to +70°C
  - I82C86H, I82C87H . . . . . -40°C to +85°C
  - M82C86H, M82C87H . . . . . -55°C to +125°C

BUS DRIVERS/LATCHES (Continued)

CA3282
CMOS OCTAL SERIAL SOLENOID DRIVER

AnswerFAX Document # 2767

- Output Current Drive Capability
  - All Outputs ON, Equal . . . . . .0.625A Each
  - Per Output Individually . . . . . 1A Each
  - Maximum Total of Outputs ON 5A
- High Voltage Power BiMOS Outputs
  - 8 Open Drain NDMOS Drivers
  - Individual Output Latch
  - Over-Current Limit Protection 1.05A
  - Over-Voltage Clamp Protection 30V

CDP68HC68S1
MULTIPLEXED BUS INTERFACE

AnswerFAX Document # 1918

- Differential Bus for Minimal EMI
- High Common Mode Noise Rejection
- Ideal for Twisted Pair Wiring
- Data Collision Detection
- Bus Arbitration
- Idle Detection
- Programmable Clock Divider
- Power-On Reset

CDP1853, CDP1853C
N-BIT 1 OF 8 DECODER

AnswerFAX Document # 1189

- Provides Direct Control of Up to 7 Input and 7 Output Devices
- Operation . . . . . .4V to 10.5V
- Prop Delay 1.6mA Drive/200ns
- CHIP ENABLE (CE) Allows Easy Expansion for Multi-level I/O Systems

CDP1881, CDP1881C, CDP1882, CDP1882C
CMOS 6-BIT LATCH AND DECODER MEMORY INTERFACES

AnswerFAX Document # 1367

- Performs Memory Address Latch and Decoder Functions Multiplexed or Non-Multiplexed
- Decodes Up to 16K Bytes of Memory
- Interfaces Directly with CDP1800-Series Microprocessors at Maximum Clock Frequency
- Can Replace CDP1866 and CDP1867 (Upward Speed and Function Capability)

ICL232
+5V POWERED DUAL RS-232 TRANSMITTER/RECEIVER

AnswerFAX Document # 3020

- Meets All RS-232E Specifications
- Requires Only Single +5V Power Supply
- On Board Voltage Doubler/Inverter
- Low Power Consumption
- 2 Drivers
  - ±9V Output Swing for +5V Input
  - 300Ω Power-off Source Impedance
  - Output Current Limiting
  - TTL/CMOS Compatible
  - 30V/µs Maximum Slew Rate
- 2 Receivers
  - ±30V Input Voltage Range
  - 3kΩ to 7kΩ Input Impedance
  - 0.5V Hysteresis to Improve Noise Rejection
- All Critical Parameters are Guaranteed Over the Entire Commercial, Industrial and Military Temperature Ranges

SPI BUS PERIPHERALS

CA3282
CMOS OCTAL SERIAL SOLENOID DRIVER

AnswerFAX Document # 2767

- Output Current Drive Capability
  - All Outputs ON, Equal . . . . . 0.625A Each
  - Per Output Individually . . . . . 1A Each
  - Maximum Total of Outputs ON 5A
- High Voltage Power BiMOS Outputs
  - 8 Open Drain NDMOS Drivers
  - Individual Output Latch
  - Over-Current Limit Protection 1.05A
  - Over-Voltage Clamp Protection 30V

CDP68HC68A2
CMOS SERIAL 10-BIT A/D CONVERTER

AnswerFAX Document # 1963

- Interfaces External Analog Signals to 6805-Series µP Via 4-Wire SPI Serial Bus
- 10-Bit Switched Capacitor, Successive Approximation A/D
- 14µs 10-Bit Conversion Time
- 8 Multiplexed Analog Input Channels
- Intrinsic Sample and Hold

CDP68HC68R1, CDP68HC68R2
CMOS 128 AND 256 WORD BY 8-BIT STATIC RAMs

AnswerFAX Document # 1544

- Fully Static Operation
- Operating Voltage Range. . . . . .3V to 5.5V
- Typical Standby Current. 1µA
- Directly Compatible with Harris/Motorola SPI Bus
- Separate Data Input and Three-State Data Output Pins
- Input Data and Clock Buffers Gated Off with Chip Enable
- Automatic Sequencing for Fast Multiple Byte Accesses
- Low Minimum Data Retention Voltage. 2V
- Wide Operating Temperature Range . . . . . -40°C to +85°C

CDP68HC68S1
MULTIPLEXED BUS INTERFACE

AnswerFAX Document # 1918

- Differential Bus for Minimal EMI
- High Common Mode Noise Rejection
- Ideal for Twisted Pair Wiring
- Data Collision/Idle Detection
- Bus Arbitration
- Programmable Clock Divider
- Power-On Reset

CDP68HC68P1
CMOS SINGLE PORT INPUT/OUTPUT

AnswerFAX Document # 1858

- Fully Static Operation
- Operating Voltage Range 3V to 6V
- Compatible with Harris/Motorola SPI Bus
- 2 External Address Pins Tied to V_{DD} or V_{SS} to Allow Up to 4 Devices to Share the Same Chip Enable
- Versatile Bit-Set and Bit-Clear Capability
- Accepts Either SCK Clock Polarity - SCK Voltage Level is Latched When Chip Enable Goes Active
- All Inputs are Schmitt-Trigger
- 8-Bit I/O Port - Each Bit can be Individually Programmed as an Input or Output VIA an 8-Bit Data Direction Register
- Programmable On Board Comparator
- Simultaneous Transfer of Compare Information to CPU During Read or Write - Separate Access Not Required

CDP68HC68T1 - CMOS REAL-TIME CLOCK WITH RAM AND POWER SENSE/CONTROL

AnswerFAX Document # 1547

- SPI - Serial Peripheral Interface
- Full Clock Features
  - Seconds, Minutes, Hours, (12/24, AM/FM), Day of Week, Date, Month, Year, (0-99), Automatic Leap Year
- 32 Word x 8-Bit RAM
- Seconds, Minutes, Hours Alarm
- Automatic Power Loss Detection
- Minimum Standby (Timekeeping) Voltages. 2.2V
- Selectable Crystal or 50/60Hz Line Input
- Buffered Clock Output
- Battery Input Pin that Powers Oscillator and Also Connects to the V_{DD} Pin when Main Power Fails
- Three Independent Interrupt Modes
  - Alarm
  - Periodic
  - Power-Down Sense

HIP7010
J1850 BUS INTERFACE

AnswerFAX Document # 3644

- SAE J1850 VPW Compliant
- Supports Non-destructive Bus Arbitration
- Extensive Error Detection
- Directly Interfaces to HIP7020 J1850 Bus Transceiver
- 4X Mode
- Programmable Clock Divider

SPI BUS PERIPHERALS (Continued)

CDP68HC68W1
DIGITAL PULSE-WIDTH MODULATOR

AnswerFAX Document # 1919

- Programmable Frequency and Duty-Cycle Output
- Serial Bus Input; Compatible with Motorola/Harris SPI Bus, Simple Shift-Register Type Interface
- 8 Lead PDIP Package
- Shmitt Trigger Clock Input . . . . . 8MHz Frequency
- Operation . . . . . 4V to 6V
- Temperature Range . . . . . -40°C to +85°C

ARINC INTERFACE

HS-3282
CMOS ARINC BUS INTERFACE CIRCUIT

AnswerFAX Document # 2964

- Data Rates Up to 100K Bits/s
- Dual and Independent Receivers, Connecting Directly to ARINC Bus
- Separate Receiver and Transmitter Sections
- 16-Bit Parallel Data Bus
- 32-Bit or 25-Bit Serial Word Length
- FIFO Holds Up to 8 ARINC Data Words for Transmission
- Single 5V Supply
- 40 Lead CerDIP and 44 Lead LCC
- Full Military Temperature Range

HS-3182
ARINC 429 BUS INTERFACE LINE DRIVER CIRCUIT

AnswerFAX Document # 2963

- TTL and CMOS Compatible Inputs
- Adjustable Rise and Fall Times Via Two External Capacitors
- Programmable Output Differential Voltage Via V_{REF} Input
- Operates at Data Rates Up to 100K Bits/s
- Output Short Circuit Proof and Contains Overvoltage
- Protection
- Outputs are Inhibited (0V) If DATA (A) and DATA (B) Inputs are Both in the "Logic One" State
- DATA (A) and DATA (B) Signals are "AND'd" with Clock and Sync Signals
- Full Military Temperature Range

CMOS STATIC RAMs

PART NUMBER	SIZE	SPEED DESIGNATION	ACCESS TIME	STANDBY CURRENT ICCSB	DATA RETURN CURRENT ICCDR	OPERATING CURRENT ICCOP	PACKAGES
≤ 1K - SYNCHRONOUS							
CDP68HC68R1	128 x 8	Serial	100ns	15µA	1µA	10mA	8 Lead PDIP
CDP68HC68R2	256 x 8	Serial	100ns	50µA	1µA	10mA	8 Lead PDIP
≤ 1K - ASYNCHRONOUS							
CDP1821C	1K x 1	13	255ns	1000µA	200µA	10mA	16 Lead SBDIP
CDP1822	256 x 4	13	450ns	500µA	100µA	8mA	22 Lead PDIP 22 Lead SBDIP
			500ns	1000µA	380µA	10mA	
CDP1823	128 x 8	13	450ns	500µA	100µA	8mA	24 Lead PDIP 24 Lead SBDIP
			505ns	1000µA	400µA	10mA	
CDP1824	32 x 8	13	710ns	200µA	40µA	8mA	18 Lead PDIP 18 Lead SBDIP
			825ns	500µA	40µA	10mA	
CDP1826C	64 x 8		1000ns	50µA	25µA	10mA	22 Lead PDIP
MWS5101, MWS5101A	256 x 4	L2	250ns	50µA	10µA	8mA	22 Lead PDIP 22 Lead SBDIP
		L3	350ns	200µA	50µA	8mA	
1K - SYNCHRONOUS							
HM-6508	1K x 1	B	180ns	10µA	5µA	4mA/MHz	18 Lead PDIP 18 Lead CerDIP
			250ns	10µA	10µA	4mA/MHz	
HM-6518	1K x 1	B	180ns	10µA	5µA	4mA/MHz	18 Lead PDIP 18 Lead CerDIP
			250ns	10µA	10µA	4mA/MHz	
HM-6551	256 x 4	B	220ns	10µA	10µA	4mA/MHz	22 Lead PDIP 22 Lead CerDIP
			300ns	10µA	10µA	4mA/MHz	
HM-6561	256 x 4	B	220ns	10µA	10µA	4mA/MHz	18 Lead PDIP 18 Lead CerDIP
			300ns	10µA	10µA	4mA/MHz	
4K - ASYNCHRONOUS							
MWS5114	1K x 4	3	200ns	100µA	50µA	8mA	18 Lead PDIP 18 Lead SBDIP
		2	250ns	100µA	50µA	8mA	
		1	300ns	250µA	125µA	8mA	

CMOS STATIC RAMs (Continued)

PART NUMBER	SIZE	SPEED DESIGNATION	ACCESS TIME	STANDBY CURRENT ICCSB	DATA RETURN CURRENT ICCDR	OPERATING CURRENT ICCOP	PACKAGES
4K - SYNCHRONOUS							
HM-6504	4K x 1	S	120ns	25µA	15µA	7mA/MHz	18 Lead PDIP 18 Lead CerDIP 18 Pad CLCC
		S/883	120ns	50µA	25µA	7mA/MHz	
		B	200ns	25µA	15µA	7mA/MHz	
		B/883	200ns	50µA	25µA	7mA/MHz	
			300ns	25µA	15µA	7mA/MHz	
		/883	300ns	50µA	25µA	7mA/MHz	
HM-6514	1K x 4	S	120ns	25µA	15µA	7mA/MHz	18 Lead PDIP 18 Lead CerDIP 18 Pad CLCC
		S/883	120ns	50µA	25µA	7mA/MHz	
		B	200ns	25µA	15µA	7mA/MHz	
		B/883	200ns	50µA	25µA	7mA/MHz	
			300ns	25µA	15µA	7mA/MHz	
		/883	300ns	50µA	25µA	7mA/MHz	
16K - ASYNCHRONOUS							
HM-65162	2K x 8	S	55ns	100µA	40µA	70mA	24 Lead CerDIP 32 Pad CLCC
		B	70ns	50µA	20µA	70mA	
			90ns	100µA	40µA	70mA	
		C	90ns	900µA	300µA	70mA	
HM-65262	16K x 1	S	65ns	50µA	20µA	50mA	20 Lead CerDIP 32 Pad CLCC
		B	70ns	50µA	20µA	50mA	
			85ns	50µA	20µA	50mA	
		C	85ns	900µA	400µA	50mA	
16K - SYNCHRONOUS							
HM-6516	2K x 8	B	120ns	50µA	25µA	10mA/MHz	24 Lead CerDIP 32 Pad CLCC
			200ns	100µA	50µA	10mA/MHz	

CMOS STATIC RAMs (Continued)

PART NUMBER	SIZE	SPEED DESIGNATION	ACCESS TIME	STANDBY CURRENT ICCSB	DATA RETURN CURRENT ICCDR	OPERATING CURRENT ICCOP	PACKAGES
64K - SYNCHRONOUS							
HM-65642	8K x 8	B	150ns	100µA	75µA	20mA	28 Lead CerDIP 32 Pad CLCC
			150ns	250µA	150µA	20mA	
		C	200ns	400µA	250µA	20mA	

CMOS PROMs

PART NUMBER	SIZE	SPEED DESIGNATION	ACCESS TIME	STANDBY CURRENT ICCSB	DATA RETURN CURRENT ICCDR	OPERATING CURRENT ICCOP	PACKAGES
4K - SYNCHRONOUS - FUSE LINK							
HM-6642	512K x 8	B	120ns	100µA	-	20mA/MHz	24 Lead Slim CerDIP 24 Lead CerDIP 28 Pad CLCC
			250ns	100µA	-	20mA/MHz	
16K - SYNCHRONOUS - FUSE LINK							
HM-6617	2K x 8	B	90ns	100µA	-	20mA/MHz	24 Lead Slim CerDIP 24 Lead CerDIP 32 Pad CLCC
			120ns	100µA	-	20mA/MHz	

REAL-TIME CLOCKS

TYPE	COMMENTS AND APPLICATIONS	NUMBER OF PINS	µP INTERFACE					OSCILLATOR				TIME KEEPING FUNCTIONS							ALARM FUNCTIONS			POWER DOWN MODES			
			STANDARD µP INTERFACE	MUX BUS OPTION	PROGRAMMABLE SQUARE WAVE OUTPUT SIGNAL	INTERRUPTS	BYTES OF GENERAL PURPOSE RAM	ON BOARD OSCILLATOR	60Hz LINE	4.197MHz, 1.049MHz, 32.768 kHz XTAL	2.097MHz XTAL	READS SEC., MIN., HR., DAY, MONTH	READS YEAR, DATE	DAYLIGHT SAVINGS TIME	AUTOMATIC END OF MONTH RECOGNITION	AUTOMATIC LEAP YEAR COMPENSATION	12 OR 24 HOUR CLOCK WITH AM/PM	BCD FORMAT AVAILABLE	1/10s, 1/100s ALARM	SEC., MIN., HR. ALARM	DAY, MONTH, YEAR, DATE ALARM	POWER SENSE INPUT/DETECTION	BATTERY INPUT PIN	STANDBY TIME KEEPING	POWER DOWN MODE (µA)
1800 SERIES																									
CDP1879	Real-Time Clock, 4V to 10.5V Operation	24	•		•	•		•		•	•	•					•	•		•					50
6805 SERIES																									
CDP6818 CDP6818A	Real-Time Clock, RAM, Motel Bus for Connection to any µP	24	•	•	•	•	50	•		•		•	•	•	•	•	•	•		•		•			50
CDP68HC68T1	Real-Time Clock with RAM and Power Sense/Control, 3-Wire SPI Bus Peripheral	16			•	•	32	•	•	•	•	•	•							•		•	•	•	12
GENERAL																									
ICM7170	Real-Time Clock-Time Keeping and Date Stamping for Personal Computers, Communica-tions, Robotics, Auto, etc.	24	•	•		•		•		•	•	•	•		•	•	•		•	•	•	•	•	•	5

TIMER/COUNTERS

TYPE	COMMENTS AND APPLICATIONS	µP I/F		COUNTER MODES						COUNTERS								
		STANDARD 8-BIT µP INTERFACE (RD, WR)	INTERRUPT ON TERMINAL COUNT	TIMEOUT OUTPUT CHANGES WHEN COUNTER DECREMENTS TO "0"	TIMEOUT STROBE ONE CLOCK-WIDE OUTPUT PULSE WHEN COUNTER DECREMENTS TO "0"	GATE CONTROLLED ONE-SHOT OUTPUT CHANGES WHEN COUNTER DECREMENTS TO "0". RETRIGGERABLE	SOFTWARE-CONTROLLED ONE-SHOT OUTPUT CHANGES WHEN COUNTER DECREMENTS TO "0". RETRIGGERABLE	RATE GENERATOR REPETITIVE CLOCK-WIDE OUTPUT PULSE	VARIABLE DUTY CYCLE REPETITIVE OUTPUT WITH PROGRAMMED FREQUENCY AND DUTY CYCLE	COUNTER FREQUENCY (MHz)	NUMBER OF CLOCK INPUTS	GATE ENABLED COUNTING	NUMBER OF GATES	NUMBER OF OUTPUTS	BINARY COUNTING	BCD COUNTING	NUMBER OF 16-BIT DOWN COUNTERS	NUMBER OF 8-BIT DOWN COUNTERS
1800 SERIES																		
CDP1878	Dual Timer/ Counter Power Supply, Motor Control, Square Wave Generators, One-Shot 4V to 10.5V Operation CDP1800 Series Peripheral	•	•	•	•	•		•	•	1	2	•	2	2	•		2	
80C86/88 SERIES																		
82C54	Programmable Interval Timer/ Counter for Generation of Accurate Time Delays Under Software Control in 80C86/88 System, Real-Time Clock, Motor Control, Watchdog Timer, Square Wave Gen.	•	•	•	•	•	•	•	• (Note 1)	10	3	•	3	3	•	•	3	
6805 SERIES																		
CDP68HC68W1	Digital Pulse Width Modulator, Modulates a Clock Input to Supply a Variable Freq. and Duty-Cycle Output Signal. 8-Lead DIP 6805 SPI Bus Serial I/F Motor Control								•	8	1			1	•			2

NOTE:

1. Reloading of count register will allow variable duty cycle. Otherwise this mode generates a square wave output.

TIMER/COUNTERS WITH DISPLAY DRIVERS

TYPE	COMMENTS AND APPLICATIONS	DISPLAY					FUNCTIONS																
		LED			LCD	VF	UNIT COUNT				UNIVERSAL COUNTERS												
		COMMON ANODE, NON-MUX	COMMON CATHODE, MUX	COMMON ANODE, MUX	DIRECT DRIVE, NON-MUX	NON-MUX	UP/DOWN	UP ONLY	DECADE	MODULE 60 (HR/MIN/SEC)	FREQUENCY	PERIOD	FREQUENCY RATIO	TIME INTERVAL	MUX BCD OUTPUTS	DISPLAY LATCH	DISPLAY BLANKING	COUNT ENABLE	LEADING ZERO BLANKING	PRESET COUNT	COMPARISON REGISTER	EQUAL AND ZERO OUTPUT	MAX COUNT SPEED (MHz)
4 DIGIT																							
ICM7217	Industrial Control: Preset Predetermining Counters, Sequencers, On Off Delay Timers, Batch Counters. Presets and Loads Compare Register From Thumb-wheel Switches			•			•		•		(Note 1)				•	•	•		•	•	•	•	2
ICM7217A			•				•		•		(Note 1)				•	•	•		•	•	•	•	2
ICM7217B				•			•			•					•	•	•		•	•	•	•	2
ICM7217C			•				•			•					•	•	•		•	•	•	•	2
4.5 DIGIT																							
ICM7224	10μA Operating Current, Can Be Cascaded for More Digits				•			•	•		(Note 1)					•		•	•				15
ICM7225	Has Brightness Adjustment. 10μA Current with Display Blanked, Cascadable	•						•	•		(Note 1)					•	•	•	•				15
5.5 DIGIT																							
ICM7249	Event Timer Counter, Hour Meter. 14 Programmable Modes. Selectable Input Filtering				•			•	•					•					•				
7 DIGIT																							
ICM7208	Use with ICM7202A for a 7 Digit Frequency Counter		•					•	•		(Note 1)					•	•	•	•				2.5
8 DIGIT																							
ICM7216A	Universal Frequency Counter with Display Drivers. 4 Internal Gate Times, Auto Decimal Point, Leading Zero Blanking, Overflow Indication. Display Off, Hold, and Reset Inputs.			•				•	•		•	•	•	•		•	•		•				10
ICM7216B			•					•	•		•	•	•	•		•	•		•				10
ICM7216C				•				•	•		•					•	•		•				10
ICM7216D			•					•	•		•					•	•		•				10
ICM7226A	Same as ICM7216 Plus Period and Time Interval Averaging. BCD Outputs, μP PIA Compatible			•				•	•		•	•	•	•	•	•	•	•	•				10
ICM7226B			•					•	•		•	•	•	•	•	•	•	•	•				10

NOTE:

1. These counters will measure frequency when used with the ICM7207 (0.01s or 0.1s timebase) or the ICM7207A (0.1s and 1s timebase).

DISPLAY DRIVERS

TYPE	COMMENTS AND APPLICATIONS	NUMBER OF CHARACTERS OR DIGITS						DISPLAY TYPE						FONT			INTERFACE				
		NUMBER OF 7-SEGMENT DIGITS	NUMBER OF DECIMAL POINTS OR ANNUNCIATORS	NUMBER OF ALPHANUMERIC 14 SEGMENTS + DP	NUMBER OF ALPHANUMERIC 16 SEGMENTS + DP	NUMBER OF ALPHANUMERIC 18 SEGMENTS	NUMBER OF DOT MATRIX	LED, COMMON ANODE NON-MUX	LED, COMMON CATHODE MUX	LED, COMMON ANODE MUX	LCD, DIRECT DRIVE	LCD, NUMBER OF WAYS MUX'D	VACUUM FLUORESCENT	HEXADECIMAL (0-9, A-F)	CODE B (0-9, H, E, L, P, -, AND BLANK)	ASCII	MUX BCD (BCD + DIGIT SELECT STROBES)	RANDOM ACCESS (DATA + ADDRESS + WR)	BIT PARALLEL, DIGIT SERIAL	BIT SERIAL	CYCLE TIME (ns)
ICM7211	Drives Conventional LCD Displays. Includes RC Oscillator, Divider Chain, Latches, Interface and LCD Drivers	4									•			•			•				1000
ICM7211A		4									•				•		•				1000
ICM7211M		4									•			•				•			200
ICM7211AM		4									•				•			•			200
ICM7212	Drives Common Anode LED Displays. 28 Current Controlled Outputs. Includes Latches, Interface and Brightness Control.	4						•						•			•				1000
ICM7212A		4						•							•		•				1000
ICM7212M		4						•						•				•			200
ICM7212AM		4						•							•			•			200
ICM7218A	3 Decode Formats Drives Up to 64 Independent LEDs. Includes 8 x 8 Memory, Multiplexed LED Drivers, Encoders, Interface and Control. Applications Include Bar Graphs.	8	8							•				•	•				•		550
ICM7218B		8	8						•					•	•			•			550
ICM7218C		8	8							•				•	•				•		500
ICM7218D		8	8						•					•	•			•			500
ICM7218E		8	8							•				•	•			•			500
ICM7228A		8	8							•				•	•				•		550
ICM7228B		8	8						•					•	•			•			550
ICM7228C		8	8							•				•	•				•		500
ICM7228D		8	8						•					•	•			•			500
ICM7231A	8 Digits, 16 Annunciators on COM, Hexadecimal	8	16									3		•				•			500
ICM7231B	8 Digits, 16 Annunciators on COM 3, Code B	8	16									3			•			•			500
ICM7231C	8 Digits, 16 Annunciators on COM 1 +3, Code B	8	16									3			•			•			500
ICM7232A	10 Digits, 20 Annunciators on COM 3, Code B	10	20									3		•						•	350
ICM7232B	10 Digits, 20 Annunciators on COM 3, Code B	10	20									3			•					•	350
ICM7232C	10 Digits, 20 Annunciators on COM 1 +3, Code B	10	20									3			•					•	350
ICM7243A	8 Alphanumeric Characters + Decimal pt. Can Be Daisy Chained or Cascaded				8				•							•		•	•		250
ICM7243B				8					•							•		•	•		250
CA3161	BCD-to Seven Segment Decoder Driver	1						•							•		•				2600
CA3168	2 Digit BCD-to Seven Segment Decoder Driver	2						•						•			•				2600

PARALLEL I/O INTERFACE

TYPE	COMMENTS AND APPLICATIONS	μP INTERFACE			PORT CONFIGURATION					INPUT/OUTPUT PORTS							
		STANDARD 8-BIT μP I/F	MULTIPLEXED BUS COMPATIBLE	INTERRUPTS	TOTAL NUMBER OF 8-BIT PORTS	INPUT PORTS PROGRAMMABLE	OUTPUT PORTS PROGRAMMABLE	BIDIRECTIONAL PORTS PROGRAMMABLE	INDIVIDUAL BITS PROGRAMMABLE	BIT SET/RESET	LATCHED INPUTS	LATCHED OUTPUTS	THREE-STATABLE OUTPUTS	DARLINGTON OUTPUT DRIVE	DIRECT READ OF OUTPUTS	STROBED INPUT/OUTPUT	STROBED BIDIRECTIONAL
CDP1851	Programmable I/O Interface, Interfaces Peripheral Equipment to the 1800 μP, Keyboard and Display Interface, Printer or CRT Interface, LED Driver 4V to 10.5V Operating Range	•		•	2	2	2	1	20		•	•		•		•	•
CDP1852	8-Bit Input/Output Port, Interfaces 8-Bit Parallel Peripheral Equipment to the 1800μP, Address Latched, Keypad Interface, Printer Interface 4V to 10.5V Operating Range				1	1	1				•	•	•	•		•	
CDP1872					1	1					•		•				
CDP1874					1	1					•		•				
CDP1875					1		1					•					
CDP6823	Parallel Interface, Peripheral Equipment Interface for 6805 μP, Motel Interface Circuit. Keyboard/Display I/F, Floppy Disc Interface, Printer/CTR Interface	•	•	•	3	3	3		24	•	•	•	•			•	
CDP68HC68P1	Single Port Input/Output 6805 SPI Bus Serial Interface 3V to 6V Operating Range, On Board Comparator (Compares Data Register and Port Pins) Port Expander, Keyboard/Printer Interface				1	1	1		8	•	•	•	•				
82C55A	Programmable Peripheral Interface Bus Hold Circuitry Eliminates Pull Up Resistors For Switch and LED Configuration	•		•	3	3	3	1		•	•	•	•	•	•	•	•

UARTS/BAUD RATE GENERATORS

TYPE	COMMENTS AND APPLICATIONS	PKG	µP INTERFACE							SERIAL INTERFACE						DATA/SET/MODEM CONTROLS				CLOCK/BAUD RATES				
		NUMBER OF PINS	RD/$\overline{WR}$ PIN	RD AND WR PINS	MUX BUS COMPATIBLE	NON-MUX BUS	NUMBER OF REGISTERS	PROGRAMMABLE INTERRUPTS	BUFFERED TRANSMIT/RECEIVE	OVERRUN, PARITY, FRAMING ERROR	PROGRAMMABLE DATA (5-8 BITS), STOP (1-2 BITS)	FULL DUPLEX	ECHO MODE/LOOP BACK	LINE BREAK GENERATION/ DETECTION	RTS, CRS, DR, TRE	DTR, DSR	DCD	RI	EXTERNAL/CLOCK	BAUD RATE (K BITS/s)	CLOCK DIVISOR (÷N)	ON CHIP BAUD RATE GENERATOR	SEPARATE RCLK AND TCLK
CDP1854	Programmable UART with False Start-Bit Detection 4V to 10V Operation	40	•			•	4	•	•	•	•	•			•					200	16		•
CDP65C51, CDP65C51A	15 Programmable Baud Rates (250K Baud with External CLK) Data Set/Modem Control Functions	28	•			•	6	•	•	•	•	•	•	•	•	•	•		•	4.16	16	•	•
CDP6853	Programmable UART with Motel Bus (250K Baud with External CLK) Data Set/Modem Control Functions	28	•	•	•	•	6	•	•	•	•	•	•	•	•	•	•		•	4.16	16	•	•
82C50A	IBM PC Compatible Modem Interface	40		•	•	•	11	•	•	•	•	•	•	•	•	•	•	•	•	625	16	•	•
82C52	1M Baud Easy-to-Program UART/ Brg. 72 Selectable Baud Rates	28		•		•	8	•	•	•	•	•	•	•	•	•			•	1M	1	•	
HD6406	Programmable UART/Brg with Complete Modem I/F DMA Capability	40		•	•	•	8	•	•	•	•	•	•	•	•	•	•	•	•	1M	1	•	
HD6402R	Industry Standard Stand-Alone UART 6402R-TTL Compatible Inputs	40					3		•	•	•	•								500	16		•
CDP6402		40					3		•	•	•	•								200	16		•
HD4702	Programmable Bit Rate Generator Provides 13 Commonly Used Baud Rates	16																		195	16	•	

INDUSTRY CMOS RAM CROSS REFERENCE

DESCRIPTION	HARRIS	AMD	EDI	FUJI-TSU	HIT-ACHI	IDT	MITSU-BISHI	MOT-OROLA	NATIONAL	NEC	OKI	HARRIS/ RCA	SMOS	TOSH-IBA	NMOS, OTHER
1K CMOS RAMs															
1K x 1, 16 Lead Synchronous	HM-6508	-	-	8401	-	-	-	6508	6508 74C929	443	-	6508 1821	-	5508	2125, 4015
1K x 1, 18 Lead Synchronous	HM-6518	-	-	-	-	-	-	6518	6518 74C930	-	-	-	-	-	-
256 x 4, 22 Lead Synchronous	HM-6551	-	-	-	-	-	-	-	6551 74C920	-	-	1822 5101	-	5101	2101
256 x 4, 18 Lead Synchronous	HM-6561	-	-	-	-	-	-	-	-	-	-	-	-	-	2111
4K CMOS RAMs															
4K x 1, 18 Lead Synchronous	HM-6504	92L44	-	8404	4315 6147	-	-	6504	6504	-	5104	-	6504	5504	2141, 2147, 315D, 4104, 4404
1K x 4, 18 Lead Synchronous	HM-6514	91L14 91L24	-	8414	4334 6148	-	58981	6514	6514	444	5114 5115	5114	6514	5514	2114, 2148, 2149, 4045, 314A
16K CMOS RAMs															
2K x 8, 24 Lead Synchronous	HM-6516	-	-	-	-	-	-	-	6516	-	-	-	-	-	-
2K x 8, 24 Lead Asynchronous	HM-65162	-	-	8416	6116	6116	5117	65116	6116	446	5128	6116	2016	5517	4802, 2116, 2016, 4016
16K x 1, 20 Lead Asynchronous	HM-65262	-	-	8167	6167	6167	-	-	-	-	-	-	2267 2367	-	2167, 8167,1400
64K CMOS RAMs															
8K x 8, 28 Lead Asynchronous	HM65642	99C88	8808A	8464	6264	7164	5164	6164	6164	4464	-	6264	2064	5564	-

80CXXX FAMILY PERIPHERAL CROSS REFERENCE

HARRIS	INTEL	NEC	OKI	MITSUBISHI	VLSI	OTHER
PERIPHERALS						
82C37A-5	82C37A-5	µPD71037 µPD8237A-5	MSM82C37A-5	M5M82C37A-4, -5	VL82C37A-4 VL82C37A-5	TMP82C37A-5 CA82C37A-5
82C37A 82C237			MSM82C37A		VL82C37A-8	KS82C37A SMC82C37A
82C37A-12 82C237-12						
82C54	82C54	µPD71054	MSM82C54	M5M82C54-6 M5M82C54	VL82C54-8	AM82C54 KS82C54 CA82C54 TMP82C54
82C54-10	82C54-2		MSM82C54-2			AM82C54-2 KS82C54-10 TMP82C54-2
82C55A-5		µPD82C56A-5	MSM82C55A-5	M5M82C55A-5		
82C55A	82C55A-2	µPD71055 µPD8255A-2	MSM82C55A-2			AM82C55A KS82C55A CA82C55A UM82C55A
82C59A-5				M5M82C59A		
82C59A	82C59A-2	µPD71059 µPD8259A	MSM82C59-2		VL82C59A-8	AM82C59A-2 CA82C59A KS82C59A TMP82C59
82C59A-12						
UARTS						
82C50A					VL82C50A	INS82C50A CA82C50A WD82C50A KS82C50A
82C52						CA82C52 KS82C52
BUS SUPPORT						
82C284-10	82C284-10					KS82C284-10
82C284-12	82C284-12					KS82C284-12
82C82		µPD71082				
82C83H		µPD71083				
82C84A	82C84A 82C84A-5	µPD71084	MSM82C84A MSM82C84A-5 MSM82C84A-2		VL82C84A-8	CA82C84A KS82C84A
82C85						
82C86H		µPD71086				MMI82C86
82C87H		µPD71087				MMI82C87
82C88	82C88	µPD71088 µPD8288	MSM82C88 MSM82C88-2		VL82C88-8	CA82C88 KS82C88
82C89						

COMPARISON OF HARRIS CMOS CDP1800-SERIES MICROPROCESSORS

FEATURES	CDP1802A CDP1802AC	CDP1802BC	CDP1805AC	CDP1806AC
Memory Addressing (Bytes)	64K	64K	64K	64K
On-Chip RAM (Bytes)	-	-	64K	-
Maximum Clock Frequency (MHz)	3.2	5	5	5
Instruction Time Min./Max. (µs)	5/7.5	3.2/4.8	3.2/16	3.2/16
Timer/Counter Bits	-	-	8	8
Prescalers	-	-	÷ 32	÷ 32
Bus Structure	Multiplexed Address Lines			
Interrupts	Yes	Yes	Yes	Yes
Latched I/O Lines	Off-Chip			
Maximum Operating Temperature Range (°C)	-55°C to +125°C			
Number of Pins, Package	40 D, E 44 Q	40 D, E 44 Q	40 D, E 44 Q	40 D, E 44 Q
Serial Interface	Q-Line			

INDUSTRY CMOS MICROPROCESSOR CROSS REFERENCE

HARRIS	INTEL	NEC	OKI	AMD
8-BIT MICROPROCESSOR				
80C88	80C88	µPD70108D-5	MSM80C88A	-
80C88-2	80C88-2	µPD70108D-8	MSM80C88A-2	-
16-BIT MICROPROCESSOR				
80C86	80C86	µPD70116D-5	MSM80C86A	-
80C86-2	80C86-2	µPD70116D-8	MSM80C86A-2	-
80C286-10	80286-10 80C286-10	-	-	80286-10
80C286-12	80286-12 80C286-12	-	-	80286-12
80C286-16	-	-	-	80286-16

CDP1800-SERIES CMOS PERIPHERALS Can be used with CMOS and NMOS Processors

HARRIS I/O TYPE	DESCRIPTION AND FUNCTION	HARRIS 1800 SERIES	MICROPROCESSOR BUS: MULTIPLEXED HARRIS/MOTOROLA 68HC05 6805	MULTIPLEXED INTEL 8048, 8051 80C48, 80C51 8049, 80C49 8088	MULTIPLEXED INTEL/NSC 8085 80C85 NSC800	NONMULTIPLEXED ZILOG Z80	NONMULTIPLEXED ROCKWELL 6502 65C02	INPUT LEVELS	(NOTE 2) FANOUT (TTL LOADS)
I/O PORTS									
CDP1851	Programmable I/O Port	Yes	Note 1	Note 1	Note 1	Yes	Yes	CMOS	1
CDP1852	Byte-Wide I/O Port	Yes	Yes	Yes	Yes	Yes	Yes	CMOS	1
CDP1857	4-Bit Bus Buffer/ Separator	Yes	Yes	Yes	Yes	Yes	Yes	CMOS	1
CDP1872	8-Bit Input Port	Yes	Yes	Yes	Yes	Yes	Yes	CMOS	3
CDP1874	8-Bit Input Port	Yes	Yes	Yes	Yes	Yes	Yes	CMOS	3
CDP1875	8-Bit Input Port	Yes	Yes	Yes	Yes	Yes	Yes	CMOS	3
MEMORY I/O DECODERS									
CDP1853	N-Bit 1 of 8 Decoder	Yes	Yes	Yes	Yes	Yes	Yes	CMOS	1
CDP1881	6-Bit Latch/Decoder	Yes	Yes	Yes	Yes	Yes	Yes	CMOS	1
CDP1882	6-Bit Latch/Decoder	Yes	Yes	Yes	Yes	Yes	Yes	CMOS	1
CDP1883	7-Bit Latch/Decoder	Yes	Yes	Yes	Yes	Yes	Yes	CMOS	1
SERIAL I/O									
CDP1854A (Note 3)	UART	Yes	Note 1	Note 1	Note 1	Note 1	Note 1	CMOS	1
CDP6402	UART	Note 1	Note 1	Note 1	Note 1	Note 1	Note 1	CMOS	1
MULTIPLY/DIVIDE									
CDP1855	8-Bit Programmable MDU	Yes	Note 1	Note 1	Note 1	Note 1	Note 1	CMOS	1
KEYBOARD INTERFACE									
CDP1871A	Keyboard Encoder	Yes	Note 1	Note 1	Note 1	Note 1	Note 1	CMOS	
TIMER FUNCTIONS									
CDP1878	Dual Counter-Timer	Yes	Note 1	Note 1	Note 1	Yes	Yes	CMOS	1
CDP1879	Real-Time Clock	Yes	Use 6818, A	Use 6818, A	Use 6818, A	Yes	Yes	CMOS	1
INTERRUPT CONTROL									
CDP1877	Programmable Interrupt Controller	Yes	No	No	No	No	No	CMOS	1

NOTES:

1. Yes but requires additional "glue parts".
2. 1 TTL load, i.e., ≤0.4V at 1.6mA.
3. Operating in 1800 compatible mode (mode 1). Otherwise see CDP6402 for mode 0 information.

Microcontrollers, Microprocessors, Memory and Peripheral Package Selection Guide

PART NUMBER	PDIP	SOIC	CerDIP	CPGA	PLCC	CLCC	MQFP	SBDIP
MICROCONTROLLERS								
CDP68HC05C4	E40.6	-	-	-	N44.65	-	Q44.10x10	-
CDP68HCL05C4	E40.6	-	-	-	N44.65	-	Q44.10x10	-
CDP68HSC05C4	E40.6	-	-	-	N44.65	-	Q44.10x10	-
CDP68HC05C8	E40.6	-	-	-	N44.65	-	Q44.10x10	-
CDP68HCL05C8	E40.6	-	-	-	N44.65	-	Q44.10x10	-
CDP68HSC05C8	E40.6	-	-	-	N44.65	-	Q44.10x10	-
CDP68HC05J3	E20.3	M20.3	-	-	-	-	-	-
CDP68HCL05J3	E20.3	M20.3	-	-	-	-	-	-
CDP68HSC05J3	E20.3	M20.3	-	-	-	-	-	-
CDP68HC05D2	E40.6	-	-	-	N44.65	-	Q44.10x10	-
CDP6805E2	E40.6	-	-	-	N44.65	-	-	D40.6
CDP6805E2C	E40.6	-	-	-	N44.65	-	-	D40.6
CDP6805E3	E40.6	-	-	-	N44.65	-	-	D40.6
CDP6805E3C	E40.6	-	-	-	N44.65	-	-	D40.6
CDP6805F2	E28.6	-	-	-	-	-	-	-
CDP6805F2C	E28.6	-	-	-	-	-	-	-
CDP6805G2	E40.6	-	-	-	-	-	-	-
CDP6805G2C	E40.6	-	-	-	-	-	-	-
CDP6402	E40.6	-	-	-	-	-	-	D40.6
CDP6402C	E40.6	-	-	-	-	-	-	D40.6
CDP65C51	E28.6	M28.3	-	-	-	-	-	D28.6
CDP6818	E24.6	-	-	-	-	-	-	D24.6
CDP6818A	E24.6	-	-	-	N28.45	-	-	D24.6
CDP6823	E40.6	-	-	-	N44.65	-	-	D40.6
CDP6853	E28.6	-	-	-	-	-	-	D28.6
CDP68HC68A2	E16.3	M20.3	-	-	-	-	-	-
CDP68HC68P1	E16.3	M16.15	-	-	-	-	-	-
CDP68HC68R1	E8.3	-	-	-	-	-	-	-
CDP68HC68R2	E8.3	-	-	-	-	-	-	-
CDP68HC68S1	E14.3	M20.3	-	-	-	-	-	-
CDP68HC68T1	E16.3	M20.3	-	-	-	-	-	D16.3
CDP68HC68W1	E8.3	-	-	-	-	-	-	-
MICROPROCESSORS								
CDP1802A, CDP1802AC	E40.6	-	-	-	N44.65	-	-	D40.6
CDP1802BC	E40.6	-	-	-	N44.65	-	-	D40.6
CDP1804AC	E40.6	-	-	-	N44.65	-	-	-
CDP1805AC	E40.6	-	-	-	N44.65	-	-	D40.6
CDP1806AC	E40.6	-	-	-	N44.65	-	-	D40.6

Package outlines and dimensions are available in Section 10.

PART NUMBER	PDIP	SOIC	CerDIP	CPGA	PLCC	CLCC	MQFP	SBDIP
80C286	-	-	-	G68.B	N68.95	-	-	-
80C86	E40.6	-	F40.6	-	N44.65	J44.A	-	-
80C88	E40.6	-	F40.6	-	N44.65	J44.A	-	-
MEMORY								
CDP1821C	-	-	-	-	-	-	-	D16.3
CDP1822, CDP1822C	E22.4	-	-	-	-	-	-	D22.4A
CDP1823, CDP1823C	E24.6	-	-	-	-	-	-	D24.6
CDP1824, CDP1824C	E18.3	-	-	-	-	-	-	D18.3
CDP1826C	E22.4	-	-	-	-	-	-	-
HM-6504	E18.3	-	F18.3	-	-	J18.B	-	-
HM-6508	E16.3	-	F16.3	-	-	-	-	-
HM-6514	E18.3	-	F18.3	-	-	J18.B	-	-
HM-6516	E24.6	-	F24.6	-	-	J32.A	-	-
HM-65162	E24.6	-	F24.6	-	-	J32.A	-	-
HM-6518	E18.3	-	F18.3	-	-	-	-	-
HM-65262	E20.3	-	F20.3	-	-	J32.A	-	-
HM-6551	E22.4	-	F22.4	-	-	-	-	-
HM-6561	E18.3	-	F18.3	-	-	-	-	-
HM-65642	E28.6	-	F28.6	-	-	J32.A	-	-
HM-6617 (Note 1)	-	-	F24.3, F24.6	-	-	J32.A	-	-
HM-6642 (Note 1)	-	-	F24.3, F24.6	-	-	J28.A	-	-
IM-6654	-	-	-	-	-	-	-	D24.6
MWS5101, MWS5101A	E22.4	-	-	-	-	-	-	D22.4A
MWS5114	E18.3	-	-	-	-	-	-	D18.3
PERIPHERALS								
CDP1851, CDP1851C	E40.6	-	-	-	-	-	-	D40.6
CDP1852, CDP1852C	E24.6	-	-	-	-	-	-	D24.6
CDP1853, CDP1853C	E16.3	-	-	-	-	-	-	D16.3
CDP1855, CDP1855C	E28.6	-	-	-	-	-	-	D28.6
CDP1857, CDP1857C	E16.3	-	-	-	-	-	-	D16.3
CDP1871A, CDP1871AC	E40.6	-	-	-	N44.65	-	-	D40.6
CDP1872C	E22.4	-	-	-	-	-	-	-
CDP1874C	E22.4	-	-	-	-	-	-	-
CDP1875C	E22.4	-	-	-	-	-	-	D22.4A
CDP1877, CDP1877C	E28.6	-	-	-	-	-	-	-
CDP1878, CDP1878C	E28.6	-	-	-	-	-	-	D28.6
CDP1879, CDP1879C	E24.6	-	-	-	-	-	-	D24.6
CDP1881, CDP1881C	E20.3	-	-	-	-	-	-	-
CDP1882, CDP1882C	E18.3	-	-	-	-	-	-	D18.3
CDP1883, CDP1883C	E20.3	-	-	-	-	-	-	-

Package outlines and dimensions are available in Section 10.

PART NUMBER	PDIP	SOIC	CerDIP	CPGA	PLCC	CLCC	MQFP	SBDIP
ICM7170	E24.6	M24.3	-	-	-	-	-	D24.6
82C237	E40.6	-	F40.6	-	N44.65	J44.A	-	-
82C284	-	-	F18.3	-	-	-	-	-
82C37A	E40.6	-	F40.6	-	N44.65	J44.A	-	-
82C54	E24.6	-	F24.6	-	N28.45	J28.A	-	-
82C55A	E40.6	-	F40.6	-	N44.65	J44.A	-	-
82C59A	E28.6	-	F28.6	-	N28.45	J28.A	-	-
82C82	E20.3	-	F20.3	-	N20.35	J20.A	-	-
82C83H	E20.3	-	F20.3	-	N20.35	J20.A	-	-
82C84A	E18.3	-	F18.3	-	N20.35	J20.A	-	-
82C85	-	-	F24.3	-	N28.45	J28.A	-	-
82C86H	E20.3	-	F20.3	-	N20.35	J20.A	-	-
82C87H	E20.3	-	F20.3	-	N20.35	J20.A	-	-
82C88	E20.3	-	F20.3	-	N20.35	J20.A	-	-
82C89	E20.3	-	F20.3	-	N20.35	J20.A	-	-
DATA COMMUNICATIONS								
CDP1854A, CDP1854AC	E40.6	-	-	-	N44.65	-	-	D40.6
CDP6402, CDP6402C	E40.6	-	-	-	-	-	-	D40.6
HD-15530	-	-	F24.6	-	-	J28.A	-	-
HD-15531	E40.6	-	F40.6	-	-	-	-	-
HD-4702	E16.3	-	F16.3	-	-	J18.B	-	-
HD-6402	E40.6	-	F40.6	-	-	-	-	-
HD-6408	E24.6	-	F24.6	-	-	-	-	-
HD-6409	E20.3	M20.3	F20.3	-	-	J20.A	-	-
HS-3182	-	-	-	-	-	J28.A	-	D16.3
HS-3282	-	-	F40.6	-	-	J44.A	-	-
ICL232	E16.3	M16.3	F16.3	-	-	-	-	-
82C50A	E40.6	-	F40.6	-	N44.65	-	-	-
82C52	E28.6	-	F28.6	-	N28.45	J28.A	-	-

NOTE:

1. Available in Slim and Wide CerDIP.

Package outlines and dimensions are available in Section 10.

Military Product Program Controls

REQUIREMENT	/883 REFERENCE	JAN	DESC/SMD	/883	/B, -8, /3
SYSTEM CONTROLS					
Product Assurance Plan	1.2.1.B.21	Per Appendix A of MIL M38510			Per Harris R and QA Manual
Facility Certification	1.2.1.B.28	RADC/DESC	Harris QC	Harris QC	Harris QC
Product Certification	1.2.1.B.26	RADC/DESC	RADC/DESC	Harris QA	Not Required
Detail Specifications	1.2.1.A	Slash Sheet	DESC DWG/SMD	Harris /883 Data Sheet	Harris Catalog
Qualifying Activity	1.2.1.B.1	RADC/DESC	Harris	Harris	Harris
Qualification Test GPC	1.2.1.B.17	Required	Per Governing Military Spec	Per Governing Military Spec	Per Harris Spec
Qualification Test GPD	1.2.1.B.17	Required	Per Governing Military Spec	Per Governing Military Spec	Per Harris Spec
QPL Listing		MIL M38510	None	None	None
Change Controls	1.2.1.B.25	MIL M38510 paragraph 3.4.2	DoD 480	DoD 480	Harris Internal ECN Controls
Change Notification	1.2.1.B.25	DESC	DESC	Data Sheet Registration	Catalog
Traceability	1.2.1.B.27	Wafer Lot	6 Week Seal	6 Week Seal	6 Week Seal
Deviations to 883	1.2.1	Per Slash Sheet	Per DESC DWG/ SMD	None	Per Harris Spec
Product Construction	1.2.1.B.2-12	Compliant	Compliant	Compliant	May Be Non-Compliant
LOCATIONS					
Fab		USA Only	USA	USA	USA
Assembly		USA/Malaysia	USA/Malaysia	USA/Malaysia	Malaysia
Screening		USA/Malaysia	USA/Malaysia	USA/Malaysia	Malaysia
Quality Conformance		USA/Malaysia	USA	USA	Malaysia

NOTE: -8 is available in support of programs with part requirements dated prior to Dec. 31, 1984 in accordance with paragraph 1.2. of MIL-STD-883 or where 883 is not currently available.

Military Grades Available

PRODUCT	JAN	SMD/ DESC	/883	/B, -8, /3
MICROPROCESSORS				
CDP1802A				X
CDP1802AC				X
MG80C286-10		X	X	
MG80C286-12		X	X	
MD80C86		X		X
MR80C86		X		X
MD80C86-2		X		X
MR80C86-2		X		X
MD80C88		X		X
MR80C88		X		X
MD80C88-2				X
MR80C88-2				X
PERIPHERALS				
CDP1852				X
CDP1852C				X
CDP1853				X
CDP1853C				X
CDP1854A				X
CDP1854AC				X
CDP1857				X
CDP1857C				X
MD82C237		X		X
MR82C237		X		X
MD82C237-12		X		X
MR82C237-12		X		X
MD82C284-10			X	
MD82C284-12			X	
MD82C37A		X		X
MR82C37A		X		X
MD82C37A-12		X		X
MR82C37A-12		X		X
MD82C37A-5		X		X
MR82C37A-5		X		X
MD82C50A-5				X
MD82C52		X		X
MR82C52		X		X
MD82C54		X		X
MR82C54		X		X

PRODUCT	JAN	SMD/ DESC	/883	/B, -8, /3
MD82C54-10				X
MR82C54-10				X
MD82C55A		X		X
MR82C55A		X		X
MD82C55A-5		X		X
MR82C55A-5		X		X
MD82C59A		X		X
MR82C59A		X		X
MD82C59A-5		X		X
MR82C59A-5		X		X
MD82C59A-12				X
MR82C59A-12				X
MD82C82		X		X
MR82C82		X		X
MD82C83H		X		X
MR82C83H		X		X
MD82C84A		X		X
MR82C84A		X		X
MD82C85				X
MR82C85				X
MD82C86H-5		X		X
MR82C86H-5		X		X
MD82C87H-5		X		X
MR82C87H-5		X		X
MD82C88		X		X
MR82C88		X		X
MD82C89		X		X
MR82C89		X		X
DATA COMMUNICATIONS				
CDP1854A				X
CDP1854AC				X
HD1-15530		X		X
HD4-15530		X		X
HD1-15531		X	X	X
HD1-15531B		X	X	X
HD1-4702		X	X	
HD4-4702				X
HD1-6402R		X	X	
HD1-6402B		X	X	

Military Grades Available

PRODUCT	JAN	SMD/ DESC	/883	/B, -8, /3
HD1-6409			X	
HD4-6409			X	
HS1-3182		X		X
HS4-3182		X		X
HS1-3282		X		X
HS4-3282		X		X
MD82C50A-5				X
MD82C52		X		X
MR82C52		X		X
CMOS RAMs				
CDP1821C				X
CDP1822C				X
CDP1823C				X
CDP1824				X
CDP1824C				X
HM1-6504		X	X	
HM1-6504B		X	X	
HM1-6504S	X	X	X	
HM1-6508			X	
HM1-6508B			X	
HM1-6514		X	X	
HM1-6514B		X	X	
HM1-6514S	X	X	X	
HM1-6516	X	X	X	
HM4-6516	X	X	X	
HM1-6516B		X	X	
HM4-6516B		X	X	
HM1-65162	X	X	X	
HM4-65162	X	X	X	
HM1-65162B	X	X	X	
HM4-65162B	X	X	X	
HM1-65162C		X	X	

PRODUCT	JAN	SMD/ DESC	/883	/B, -8, /3
CMOS RAMs (Continued)				
HM4-65162C		X	X	
HM1-6518			X	
HM1-6518B			X	
HM1-65262	X	X	X	
HM4-65262	X	X	X	
HM1-65262B	X	X	X	
HM4-65262B	X	X	X	
HM1-6551				X
HM1-6551B				X
HM1-6561				X
HM1-6561B				X
HM1-65642			X	X
HM4-65642			X	X
HM1-65642B	X		X	
HM4-65642B	X		X	
HM1-65642C			X	
HM4-65642C			X	
CMOS PROMs				
HM1-6617		X	X	
HM6-6617		X	X	
HM4-6617		X	X	
HM1-6617B		X	X	
HM6-6617B		X	X	
HM4-6617B		X	X	
HM1-6642		X	X	
HM6-6642		X	X	
HM4-6642		X	X	
HM1-6642B		X	X	
HM6-6642B		X	X	
HM4-6642B		X	X	

Harris JAN-SMD-/883 Part Number Listing

HARRIS PART NUMBER	JAN PART NUMBER	SMD/DESC PART NUMBER	/883 PART NUMBER
MICROPROCESSOR PRODUCTS			
MG80C286-12		5962-9067801MXC	MG80C286-12/883
MG80C286-10		5962-9067801MXC	MG80C286-10/883
MD80C86		8405201QA	
MR80C86		8405201XA	
MD80C86-2		8405202QA	
MR80C86-2		8405202XA	
MD80C88		5962-8601601QA	
MR80C88		5962-8601601XA	
MD82C237		5962-9054304QA	
MR82C237		5962-9054304XA	
MD82C237-12		5962-9054305QA	
MR82C237-12		5962-9054305XA	
MD82C284-10			MD82C284-10/883
MD82C284-12			MD82C284-12/883
MD82C37A		5962-9054302QA	
MR82C37A		5962-9054302XA	
MD82C37A-12		5962-9054303QA	
MR82C37A-12		5962-9054303XA	
MD82C37A-5		5962-9054301QA	
MR82C37A-5		5962-9054301XA	
MD82C52		8501501XA	
MR82C52		85015013A	
MD82C54		8406501JA	
MR82C54		84065013A	
MD82C55A		8406602QA	
MR82C55A		8406602XA	
MD82C55A-5		8406601QA	
MR82C55A-5		8406601XA	
MD82C59A		5962-8501602YA	
MR82C59A		5962-85016023A	
MD82C59A-5		5962-8501601YA	
MR82C59A-5		5962-85016013A	
MD82C82		8406701RA	
MR82C82		84067012A	
MD82C83H		8406702RA	
MR82C83H		84067022A	

Harris JAN-SMD-/883 Part Number Listing

HARRIS PART NUMBER	JAN PART NUMBER	SMD/DESC PART NUMBER	/883 PART NUMBER
MD82C84A		8406801VA	
MR82C84A		84068012A	
MD82C86H-5		5962-8757701RA	
MR82C86H-5		5962-87577012A	
MD82C87H-5		5962-8757702RA	
MR82C87H-5		5962-87577022A	
MD82C88		8406901RA	
MR82C88		84069012A	
MD82C89		5962-8552801RA	
MR82C89		5962-85528012A	
DATA COMMUNICATION PRODUCTS			
HD1-15530		7802901JA	
HD4-15530		78029013A	
HD1-15531			HD1-15531/883
HD1-15531B			HD1-15531B/883
HD1-4702		5962-9051801MEA	HD1-4702/883
HD1-6402B		5962-9052502MQA	HD1-6402B/883
HD1-6402R		5962-9052501MQA	HD1-6402R/883
HD1-6409			HD1-6409/883
HD4-6409			HD4-6409/883
HS1-3182		5962-8687901EA	
HS4-3182		5962-86879013A	
HS1-3282		5962-8688001QA	
HS4-3282		5962-8688001XA	
CMOS MEMORY PRODUCTS			
1K CMOS STATIC RAMs			
HM1-6508			HM1-6508/883
HM1-6508B			HM1-6508B/883
HM1-6518			HM1-6518/883
HM1-6518B			HM1-6518B/883
HM1-6551			HM1-6551/883
HM1-6551B			HM1-6551B/883
HM1-6561			HM1-6561/883
HM1-6561B			HM1-6561B/883
4K CMOS STATIC RAMs			
HM1-6504		8102405VA	HM1-6504/883
HM1-6504B		8102403VA	HM1-6504B/883
HM1-6504S	M38510/24501BVA	8102401VA	HM1-6504S/883
HM1-6514		8102406VA	HM1-6514/883

Harris JAN-SMD-/883 Part Number Listing

HARRIS PART NUMBER	JAN PART NUMBER	SMD/DESC PART NUMBER	/883 PART NUMBER
HM1-6514B		8102404VA	HM1-6514B/883
HM1-6514S	M38510/24502BVA	8102402VA	HM1-6514S/883
16K CMOS SYNCHRONOUS STATIC RAMs			
HM1-6516	M38510/29102BJA	8403601JA	HM1-6516/883
HM4-6516		8403601ZA	HM4-6516/883
HM1-6516B		8403607JA	HM1-6516B/883
HM4-6516B		8403607ZA	HM4-6516B/883
16K CMOS ASYNCHRONOUS STATIC RAMs			
HM1-65162	M38510/29104BJA	8403602JA	HM1-65162/883
HM4-65162		8403602ZA	HM4-65162/883
HM1-65162B	M38510/29110BJA	8403606JA	HM1-65162B/883
HM4-65162B		8403606ZA	HM4-65162B/883
HM1-65162C		8403603JA	HM1-65162C/883
HM4-65162C		8403603ZA	HM4-65162C/883
HM1-65262	M38510/29103BRA	8413201RA	HM1-65262/883
HM4-65262		8413201YA	HM4-65262/883
HM1-65262B	M38510/29109BRA	8413203RA	HM1-65262B/883
HM4-65262B		8413203YA	HM4-65262B/883
64K CMOS STATIC RAMs			
HM1-65642		8552514XA	HM1-65642/883
HM4-65642		8552514YA	HM4-65642/883
HM1-65642B	M38510/29205BXA		HM1-65642B/883
HM4-65642B			HM4-65642B/883
HM1-65642C			HM1-65642C/883
HM4-65642C			HM4-65642C/883
CMOS FUSE LINK PROMs			
HM1-6617		5962-8954001JA	HM1-6617/883
HM4-6617		5962-8954001XA	HM4-6617/883
HM6-6617		5962-8954001LA	HM6-6617/883
HM1-6617B		5962-8954002JA	HM1-6617B/883
HM4-6617B		5962-8954002XA	HM4-6617B/883
HM6-6617B		5962-8954002LA	HM6-6617B/883
HM1-6642		5962-8869001JA	HM1-6642/883
HM4-6642		5962-88690013A	HM4-6642/883
HM6-6642		5962-8869001LA	HM6-6642/883
HM1-6642B		5962-8869002JA	HM1-6642B/883
HM4-6642B		5962-88690023A	HM4-6642B/883
HM6-6642B		5962-8869002LA	HM6-6642B/883

Harris CMOS Logic Families

HIGH SPEED CMOS (HC/HCT) LOGIC SSI, MSI LOGIC FUNCTIONS AND LOW CURRENT BUS INTERFACE DEVICES

- 3μm CMOS Process
- HCT Provides Drop-In Replacement for LSTTL
- HC Provides Direct Interface to CMOS
- Typical Gate Propagation Delay = 8ns at 5V
- JEDEC Standard 4mA, 6mA Sink/Source Drive Current Capability
- 2V to 6V Operation for HC Devices
- 4.5V to 5.5V Operation for HCT Devices

ADVANCED CMOS (AC/ACT) LOGIC SSI, MSI LOGIC FUNCTIONS AND MEDIUM CURRENT BUS INTERFACE DEVICES

- 1.5μm CMOS Process
- ACT Provides Drop-In Replacement for Bipolar FAST
- AC Provides Direct Interface to CMOS
- Typical Gate Propagation Delay = 3ns at 5V
- JEDEC Standard 24mA Sink/Source Drive Current Capability
- 1.5V to 5.5V Operation for AC Devices
- 4.5V to 5.5V Operation for ACT Devices
- Low Groundbounce V_{OLP} = 1V Typical

FCT BUS INTERFACE DEVICES

- 8-Bit, 9-Bit, and 10-Bit High Current Drive Bus Interface Devices
- 1.5μm, Low Power BiCMOS Process
- Drop-In Replacement for Bipolar FAST and AS Logic
- Typical Gate Propagation Delay = 3ns at 5V
- JEDEC Standard 64mA, 48mA Sink Current Capability
- 4.75V to 5.25V Operation
- No Input/Output Diodes to V_{CC}
  - Eliminates Bus Contention
  - Allows Hot Card Insertion
- Low Groundbounce V_{OLP} = 1V Typical

CD4000 LOGIC SSI AND MSI LOGIC FUNCTIONS

- 7μm CMOS Process
- CMOS Input Compatibility
- Typical Gate Propagation Delay = 60ns at 5V
- JEDEC Standard 0.4mA Sink/Source Drive Current Capability
- High Voltage Operation
  - 3V to 18V Operation for B Series
  - 3V to 12V Operation for A Series
- High Noise Immunity at 10V to 15V; Ideal for Noisy Environments

Logic Ordering Information

HC/HCT HIGH SPEED CMOS AND AC/ACT ADVANCED CMOS NOMENCLATURE

(Example: CD 74 ACT 245E, CD 54 HC 245F)

CD — Prefix Designation for Harris Digital Logic IC

XX — TEMPERATURE RANGE
- 74 - Temperature Range: -55°C to +125°C
- 54 - Temperature Range: -55°C to +125°C

XXX — LOGIC LEVEL
- HC - High Speed CMOS Logic CMOS Input Levels
- HCT - High Speed CMOS Logic TTL Input Levels
- HCU - High Speed CMOS Logic CMOS Input Levels, Unbuffered
- AC - Advanced CMOS Logic CMOS Input Levels
- ACT - Advanced CMOS Logic TTL Input Levels

XXXXX — Type Designation Up to 5 Digits

X — PACKAGE DESIGNATION
- E - Plastic DIP
- EN - Plastic Slim-Line 24 Lead DIP
- F - Ceramic Frit-Seal DIP
- M - Plastic Surface Mount SOIC
- H - Chip
- SM - Plastic Shrink SOIC (SSOP)

XX — HIGH-RELIABILITY SCREENING
- 3A - Fully Compliant with MIL-STD-883 (See Note)
- X - 160 Hour Burn-In (+125°C)

FCT NOMENCLATURE

(Example: CD 74 FCT 245 ATE)

CD — Prefix Designation for Harris Digital Logic IC

XX — TEMPERATURE RANGE
- 74 - Standard Temperature Range: 0°C to +70°C
- 54 - Extended Temperature Range: -55°C to +125°C

FCT — Bus Interface Family: TTL Input Levels

XXXXX — Type Designation Up to 5 Digits

X — SPEED GRADE
- Blank, A - Standard Equivalent to FAST™
- AT - 30% Faster Than Standard or Standard Speed for 8xx/29xxx Series. Low Noise/Low Groundbounce Output Structure

X — PACKAGE DESIGNATION
- E - Plastic DIP
- EN - Plastic Slim-Line 24 Lead DIP
- M - Plastic Surface Mount SOIC
- H - Chip
- SM - Plastic Shrink SOIC (SSOP)

CD4000 NOMENCLATURE

(Example: CD4011BE)

CD — Prefix Designation for Harris Digital Logic IC

4XXXX — Type Designation Up to 5 Digits

XX — SUPPLY VOLTAGE
- A - 12V Max
- B - 18V Max
- UB - 18V Max, Unbuffered

X — PACKAGE DESIGNATION
- D - Ceramic Side Brazed DIP
- E - Plastic DIP
- F - Ceramic Frit-Seal DIP
- K - Ceramic Flatpack
- H - Chip

X — HIGH-RELIABILITY SCREENING
- 3 - Non-Compliant with MIL-STD-883 Class B
- 3A - Fully Compliant with MIL-STD-883 Class B (See Note)
- X - 160 Hour Burn-In (+125°C)

NOTE: Most Harris CMOS Logic ICs are available with burn-in to enhance commercial reliability. This cost-effective approach is provided by the Harris Enhanced Product. Enhanced Product is identified with the suffix "X", e.g., CD74HC/HCT373EX.

FAST™ is a registered trademark of Fairchild Semiconductor Corporation

RELIABILITY CLASS AND PACKAGE OF HARRIS HIGH-RELIABILITY CD54HC/HCT ICs

CD54HCT00 F 3A

HARRIS DEVICE PART NUMBER
HC = CMOS Compatible
HCU = CMOS Compatible
HCT = TTL Compatible

PACKAGE DESIGNATION
F = Dual-In-Line Ceramic (CerDIP)

SCREENING LEVEL
3A = Class B, MIL-STD-883 Compliant

SMD AND DESC PART NUMBERS

5962 - 8XXXX 0X M X X

SMD ID NUMBER
(DOES NOT CHANGE)

DESC AND SMD
DRAWING NUMBER

DEVICE TYPE
(PARAGRAPH 1.2.1 OF SMD/DESC DRAWING)

DEVICE CLASS
(DESIGNATOR IF APPLICABLE)

PACKAGE OUTLINE	
LETTER = TERMINALS	CASE OUTLINE
C = 14	D-1
E = 16	D-2
R = 20	D-8
J = 24	D-3

LEAD FINISH
A = SOLDER DIP

RELIABILITY CLASS AND PACKAGE OF HARRIS HIGH-RELIABILITY CD54AC/ACT ICs

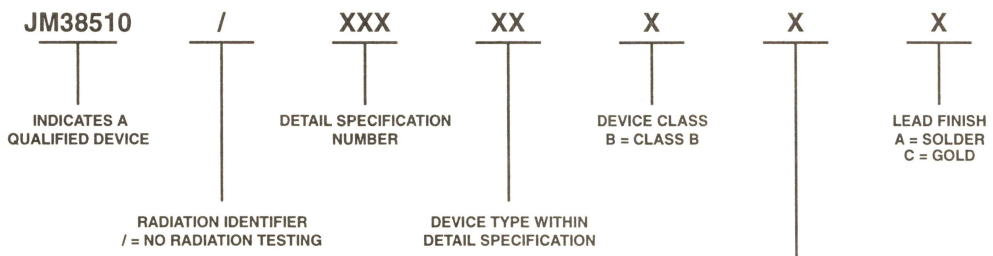
CD54ACT00 F 3A

HARRIS DEVICE PART NUMBER
AC = CMOS Compatible
ACT = TTL Compatible

PACKAGE DESIGNATION
F = Dual-In-Line Ceramic (CerDIP)

SCREENING LEVEL
3A = Class B, MIL-STD-883 Compliant

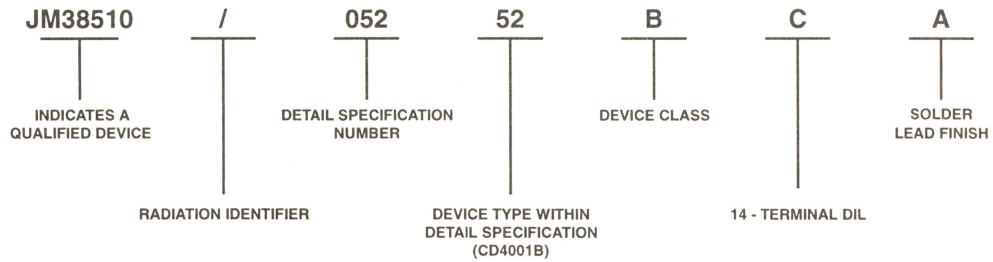
HARRIS CD4000B SERIES MIL-I-38510 JAN-QUALIFIED



PACKAGE OUTLINE

LETTER = TERMINALS	PACKAGE	CASE OUTLINE	CONFIGURATION
C = 14	DIL	D-1	1
E = 16	DIL	D-2	1

EXAMPLE



NOTE: Branding: JAN products are single branded with the MIL-I-38510 nomenclature.

SMD AND DESC DRAWING PRODUCT

5962	XXXXX	XX	X	X
SMD ID NUMBER (DOES NOT CHANGE)	DESC AND SMD DRAWING NUMBER	DEVICE TYPE (PARAGRAPH 1.2.1 OF SMD/DESC DRAWING)		LEAD FINISH A = SOLDER

PACKAGE OUTLINE

LETTER = TERMINALS	CASE OUTLINE	CONFIGURATION
C = 14	D-1	1
E = 16	D-2	1
J = 24	D-3	1

SMD EXAMPLE

5962	90640	01	C	A
SMD ID NUMBER	SMD DRAWING NUMBER	DEVICE TYPE 01 = 4016B FROM DRAWING	14 - TERMINAL DIL	SOLDER LEAD FINISH

DESC EXAMPLE

77023	01	E	A
DESC DRAWING NUMBER	DEVICE TYPE 01 = 4520B FROM DRAWING	16 - TERMINAL DIL	SOLDER LEAD FINISH

Branding: SMD/DESC products are double branded with both the Harris nomenclature and SMD/DESC nomenclature.

STANDARD CD4000 SERIES /883 SCREENED PRODUCT

CD4000B	D	3
PART NUMBER CD4000B	PACKAGE DESIGNATOR D = DUAL-IN-LINE METAL SEAL CERAMIC K = FLAT PACK F = DUAL-IN-LINE FRIT SEAL CERAMIC	RELIABILITY SCREENING LEVEL 3A = CLASS B, MIL-STD-883 3 = CLASS B, MODIFIED

HC/HCT SERIES

CMOS LOGIC		DESCRIPTION	NUMBER OF LEADS	ANSWERFAX DOCUMENT NUMBER
CD54HC/HCT00	CD74HC/HCT00	Quad 2-Input NAND Gate	14	1464
CD54HC/HCT02	CD74HC/HCT02	Quad 2-Input NOR Gate	14	1647
CD54HC/HCT03	CD74HC/HCT03	Quad 2-Input NAND Gate with Open Drain	14	1832
CD54HC/HCT04	CD74HC/HCT04	Hex Inverter/Buffer	14	1471
CD54HC/HCT08	CD74HC/HCT08	Quad 2-Input AND Gate	14	1549
CD54HC/HCT10	CD74HC/HCT10	Triple 3-Input NAND Gate	14	1551
CD54HC/HCT11	CD74HC/HCT11	Triple 3-Input AND Gate	14	1475
CD54HC/HCT14	CD74HC/HCT14	Hex Inverting Schmitt Trigger	14	1781
CD54HC/HCT20	CD74HC/HCT20	Dual 4-Input NAND Gate	14	1601
CD54HC/HCT21	CD74HC/HCT21	Dual 4-Input AND Gate	14	1782
CD54HC/HCT27	CD74HC/HCT27	Triple 3-Input NOR Gate	14	1648
CD54HC/HCT30	CD74HC/HCT30	8-Input NAND Gate	14	1652
CD54HC/HCT32	CD74HC/HCT32	Quad 2-Input OR Gate	14	1643
CD54HC/HCT42	CD74HC/HCT42	BCD-to-Decimal Decoder (1-to-10)	16	1689
CD54HC/HCT73	CD74HC/HCT73	Dual J-K Flip-Flop with Reset	14	1721
CD54HC/HCT74	CD74HC/HCT74	Dual D Flip-Flop with Set and Reset	14	1476
CD54HC/HCT75	CD74HC/HCT75	Dual 2-Bit Bistable Transparent Latch	16	1666
CD54HC/HCT85	CD74HC/HCT85	4-Bit Magnitude Comparator	16	1770
CD54HC/HCT86	CD74HC/HCT86	Quad 2-Input EXCLUSIVE-OR Gate	14	1644
CD54HC/HCT93	CD74HC/HCT93	4-Bit Binary Ripple Counter	14	1849
CD54HC/HCT107	CD74HC/HCT107	Dual J-K Flip-Flop with Reset	14	1722
CD54HC/HCT109	CD74HC/HCT109	Dual J-K Flip-Flop with Set and Reset	16	1667
CD54HC/HCT112	CD74HC/HCT112	Dual J-K Flip-Flop with Set and Reset	16	1843
CD54HC/HCT123	CD74HC/HCT123	Dual Retriggerable Monostable Multivibrator with Reset	16	1708
CD54HC/HCT125	CD74HC/HCT125	Quad 3-State Buffer	14	1771
CD54HC/HCT126	CD74HC/HCT126	Quad 3-State Buffer	14	1772
CD54HC/HCT132	CD74HC/HCT132	Quad 2-Input NAND Schmitt Trigger	14	1649
CD54HC/HCT137	CD74HC/HCT137	3-to-8-Line Decoder with Latch, Inverting	16	1886
CD54HC/HCT138	CD74HC/HCT138	3-to-8-Line Decoder/Demultiplexer, Inverting	16	1477
CD54HC/HCT139	CD74HC/HCT139	Dual 2-to-4-Line Decoder/Demultiplexer	16	1545
CD54HC/HCT147	CD74HC/HCT147	10-to-4-Line Priority Encoder	16	1773
CD54HC/HCT151	CD74HC/HCT151	8-Input Multiplexer	16	1645
CD54HC/HCT153	CD74HC/HCT153	Dual 4-Input Multiplexer	16	1774
CD54HC/HCT154	CD74HC/HCT154	4-to-16-Line Decoder/Demultiplexer	24	1657
CD54HC/HCT157	CD74HC/HCT157	Quad 2-Input Multiplexer	16	1642

HC/HCT SERIES (Continued)

CMOS LOGIC		DESCRIPTION	NUMBER OF LEADS	ANSWERFAX DOCUMENT NUMBER
CD54HC/HCT158	CD74HC/HCT158	Quad 2-Input Multiplexer, Inverting	16	1642
CD54HC/HCT160	CD74HC/HCT160	Synchronous BCD Decade Counter, Asynchronous Reset	16	1550
CD54HC/HCT161	CD74HC/HCT161	Synchronous 4-Bit Binary Counter, Asynchronous Reset	16	1550
CD54HC/HCT162	CD74HC/HCT162	Synchronous BCD Decade Counter, Synchronous Reset	16	1550
CD54HC/HCT163	CD74HC/HCT163	Synchronous 4-Bit Binary Counter, Synchronous Reset	16	1550
CD54HC/HCT164	CD74HC/HCT164	8-Bit Serial-In/Parallel-Out Shift Register	14	1658
CD54HC/HCT165	CD74HC/HCT165	8-Bit Parallel-In/Serial-Out Shift Register	16	1672
CD54HC/HCT166	CD74HC/HCT166	8-Bit Parallel-In/Serial-Out Shift Register	16	1501
CD54HC/HCT173	CD74HC/HCT173	Quad D Flip-Flop, Three-State	16	1641
CD54HC/HCT174	CD74HC/HCT174	Hex D-Type Flip-Flop with Reset	16	1608
CD54HC/HCT175	CD74HC/HCT175	Quad D-Type Flip-Flop with Reset	16	1474
CD54HC/HCT181	CD74HC/HCT181	4-Bit Arithmetic Logic Unit	24	1829
CD54HC/HCT190	CD74HC/HCT190	Presettable Synchronous BCD Decade Up/Down Counter	16	1662
CD54HC/HCT191	CD74HC/HCT191	Synchronous 4-Bit Binary Up/Down Counter	16	1662
CD54HC/HCT192	CD74HC/HCT192	Synchronous BCD Decade Up/Down Counter	16	1674
CD54HC/HCT193	CD74HC/HCT193	Synchronous 4-Bit Binary Up/Down Counter	16	1674
CD54HC/HCT194	CD74HC/HCT194	4-Bit Bidirectional Universal Shift Register	16	1668
CD54HC/HCT195	CD74HC/HCT195	4-Bit Parallel Access Shift Register	16	1482
CD54HC/HCT221	CD74HC/HCT221	Dual Monostable Multivibrator with Reset	16	1670
CD54HC/HCT237	CD74HC/HCT237	3-to-8-Line Decoder/Demultiplexer with Address Latches	16	1886
CD54HC/HCT238	CD74HC/HCT238	3-to-8-Line Decoder/Demultiplexer	16	1477
CD54HC/HCT240	CD74HC/HCT240	Octal Buffer Line Driver, Three-State, Inverting	20	1656
CD54HC/HCT241	CD74HC/HCT241	Octal Buffer Line Driver, Three-State	20	1656
CD54HC/HCT242	CD74HC/HCT242	Quad-Bus Transceiver, Three-State, Inverting	14	1488
CD54HC/HCT243	CD74HC/HCT243	Quad-Bus Transceiver, Three-State	14	1488
CD54HC/HCT244	CD74HC/HCT244	Octal-Buffer Line Driver, Three-State	20	1656
CD54HC/HCT245	CD74HC/HCT245	Octal-Bus Transceiver, Three-State	20	1651
CD54HC/HCT251	CD74HC/HCT251	8-Input Multiplexer, Three-State	16	1489
CD54HC/HCT253	CD74HC/HCT253	Dual 4-Input Multiplexer, Three-State	16	1673
CD54HC/HCT257	CD74HC/HCT257	Quad 2-Input Multiplexer, Three-State; Non-Inverting Outputs	16	1650
CD54HC/HCT258	CD74HC/HCT258	Quad 2-Input Multiplexer, Three-State; Inverting Outputs	16	1775
CD54HC/HCT259	CD74HC/HCT259	8-Bit Addressable Latch	16	1727
CD54HC/HCT273	CD74HC/HCT273	Octal D-Type Flip-Flop with Reset	20	1479
CD54HC/HCT280	CD74HC/HCT280	9-Bit Odd/Even Parity Generator/Checker	14	1669
CD54HC/HCT283	CD74HC/HCT283	4-Bit Adder with Fast Carry	16	1848
CD54HC/HCT297	CD74HC/HCT297	Digital Phase-Locker Loop Filter	16	1852

HC/HCT SERIES (Continued)

CMOS LOGIC		DESCRIPTION	NUMBER OF LEADS	ANSWERFAX DOCUMENT NUMBER
CD54HC/HCT299	CD74HC/HCT299	8-Bit Universal Shift Register Three-State	20	1485
CD54HC/HCT354	CD74HC/HCT354	8-Input Multiplexer/Register, Three-State	20	1690
CD54HC/HCT356	CD74HC/HCT356	8-Input Multiplexer/Register, Three-State	20	1690
CD54HC/HCT365	CD74HC/HCT365	Hex Buffer/Line Driver, Three-State	16	1539
CD54HC/HCT366	CD74HC/HCT366	Hex Buffer/Line Driver, Three-State, Inverting	16	1539
CD54HC/HCT367	CD74HC/HCT367	Hex Buffer/Line Driver, Three-State	16	1538
CD54HC/HCT368	CD74HC/HCT368	Hex Buffer/Line Driver, Three-State, Inverting	16	1538
CD54HC/HCT373	CD74HC/HCT373	Octal Transparent Latch, Three-State	20	1679
CD54HC/HCT374	CD74HC/HCT374	Octal D Flip-Flop, Three-State	20	1663
CD54HC/HCT377	CD74HC/HCT377	Octal D-Type Flip-Flop with Data Enable	20	1675
CD54HC/HCT390	CD74HC/HCT390	Dual Decade Ripple Counter	16	1838
CD54HC/HCT393	CD74HC/HCT393	Dual 4-Bit Binary Ripple Counter	14	1653
CD54HC/HCT423	CD74HC/HCT423	Dual Retriggerable Monostable Multivibrator with Reset	16	1708
CD54HC/HCT533	CD74HC/HCT533	Octal Transparent Latch, Three-State; Inverting	20	1599
CD54HC/HCT534	CD74HC/HCT534	Octal D Flip-Flop, Three-State, Inverting	20	1640
CD54HC/HCT540	CD74HC/HCT540	Octal Buffer Line Driver, Three-State, Inverting	20	1659
CD54HC/HCT541	CD74HC/HCT541	Octal Buffer Line Driver, Three-State	20	1659
CD54HC/HCT563	CD74HC/HCT563	Octal Transparent Latch, Three-State, Inverting	20	1599
CD54HC/HCT564	CD74HC/HCT564	Octal D Flip-Flop, Three-State, Inverting	20	1640
CD54HC/HCT573	CD74HC/HCT573	Octal Transparent Latch, Three-State	20	1679
CD54HC/HCT574	CD74HC/HCT574	Octal D Flip-Flop, Three-State	20	1663
CD54HC/HCT583	CD74HC/HCT583	4-Bit BCD Full Adder with Fast Carry	16	1828
CD54HC/HCT597	CD74HC/HCT597	8-Bit Shift Register with Input Storage	16	1915
CD54HC/HCT640	CD74HC/HCT640	Octal Bus Transceiver, Three-State, Inverting	20	1677
CD54HC/HCT643	CD74HC/HCT643	Octal Bus Transceiver, Three-State, True/Inverting	20	1677
CD54HC/HCT646	CD74HC/HCT646	Octal Bus Transceiver/Register, Three-State	24	1664
CD54HC/HCT648	CD74HC/HCT648	Octal Bus Transceiver/Register, Three-State, Inverting	24	1664
CD54HC/HCT651	CD74HC/HCT651	Octal Bus Transceiver/Register, Three-State, Inverting	24	2229
CD54HC/HCT652	CD74HC/HCT652	Octal Bus Transceiver/Register, Three-State, Non-Inverting	24	2229
CD54HC/HCT670	CD74HC/HCT670	4 x 4 Register File, Three-State	16	1660
CD54HC/HCT688	CD74HC/HCT688	8-Bit Magnitude Comparator	20	1646
CD54HC/HCT4002	CD74HC/HCT4002	Dual 4-Input NOR Gate	14	1776
CD54HC/HCT4015	CD74HC/HCT4015	Dual 4-Stage Static Shift Register	16	1678
CD54HC/HCT4016	CD74HC/HCT4016	Quad Bilateral Switch	14	1917
CD54HC/HCT4017	CD74HC/HCT4017	Decade Counter/Divider with 10 Decoded Outputs	16	1639
CD54HC/HCT4020	CD74HC/HCT4020	14-Stage Binary Ripple Counter	16	1484

HC/HCT SERIES (Continued)

CMOS LOGIC		DESCRIPTION	NUMBER OF LEADS	ANSWERFAX DOCUMENT NUMBER
CD54HC/HCT4024	CD74HC/HCT4024	7-Stage Binary Ripple Counter	16	1638
CD54HC/HCT4040	CD74HC/HCT4040	12-Bit Binary Counter	16	1483
CD54HC/HCT4046A	CD74HC/HCT4046A	Phase-Locked Loop with VCO	16	1854
CD54HC4049	CD74HC4049	Hex Inverting High-to-Low Level Shifter	16	1543
CD54HC4050	CD74HC4050	Hex High-to-Low Level Shifter	16	1543
CD54HC/HCT4051	CD74HC/HCT4051	8-Channel Analog Multiplexer/Demultiplexer	16	1676
CD54HC/HCT4052	CD74HC/HCT4052	Dual 4-Channel Analog Multiplexer/Demultiplexer	16	1676
CD54HC/HCT4053	CD74HC/HCT4053	Triple 2-Channel Analog Multiplexer/Demultiplexer	16	1676
CD54HC/HCT4059	CD74HC/HCT4059	Programmable Divide by "N" Counter	24	1853
CD54HC/HCT4060	CD74HC/HCT4060	14-Stage Binary Counter with Oscillator	16	1654
CD54HC/HCT4066	CD74HC/HCT4066	Quad Bilateral Switch	14	1777
CD54HC/HCT4067	CD74HC/HCT4067	16-Channel Analog Multiplexer/Demultiplexer	24	1783
CD54HC/HCT4075	CD74HC/HCT4075	Triple 3-Input OR Gate	14	1778
CD54HC/HCT4094	CD74HC/HCT4094	8-Stage Shift-and-Store Bus Register	16	1779
CD54HC/HCT4316	CD74HC/HCT4316	Quad Analog Switch	16	1916
CD54HC/HCT4351	CD74HC/HCT4351	Analog MUX with Latch	20	2145
CD54HC/HCT4352	CD74HC/HCT4352	Analog MUX with Latch	20	2145
CD54HC/HCT4353	CD74HC/HCT4353	Analog MUX with Latch	20	2145
CD54HC/HCT4510	CD74HC/HCT4510	Up/Down Counter, BCD	16	1823
CD54HC/HCT4511	CD74HC/HCT4511	BCD-to-7-Segment Latch/Decoder/Driver	16	1786
CD54HC/HCT4514	CD74HC/HCT4514	4-to-16-Line Decoder/Demultiplexer with Input Latch	24	1597
CD54HC/HCT4515	CD74HC/HCT4515	4-to-16-Line Decoder with Input Latches	24	1597
CD54HC/HCT4516	CD74HC/HCT4516	Up/Down Counter, Binary	16	1823
CD54HC/HCT4518	CD74HC/HCT4518	Dual Synchronous BCD Counter	16	1665
CD54HC/HCT4520	CD74HC/HCT4520	Dual 4-Bit Synchronous Binary Counter	16	1665
CD54HC/HCT4538	CD74HC/HCT4538	Dual Precision Monostable Multivibrator	16	1671
CD54HC/HCT4543	CD74HC/HCT4543	BCD-to-7-Segment Latch Decoder/Driver for LCDs	16	1822
CD54HC/HCT7030	CD74HC/HCT7030	9-Bit x 64 Word FIFO Register, Three-State	28	2122
CD54HC/HCT7046A	CD74HC/HCT7046A	Phase-Locked Loop with In-Lock Detection	16	1920
CD54HC7266	CD74HC7266	Quad EXCLUSIVE-NOR Gate	14	1780
CD54HC/HCT40102	CD74HC/HCT40102	8-Bit Synchronous BCD Down Counter	16	1596
CD54HC/HCT40103	CD74HC/HCT40103	8-Bit Binary Down Counter	16	1596
CD54HC/HCT40104	CD74HC/HCT40104	4-Bit Bidirectional Universal Shift Register, Three-State	16	1661
CD54HC/HCT40105	CD74HC/HCT40105	4 Bits x 16 Words FIFO Register	16	1834
CD54HCU04	CD74HCU04	Hex Inverter (Unbuffered)	14	1655

AC/ACT SERIES

CMOS LOGIC		DESCRIPTION	NUMBER OF LEADS	ANSWERFAX DOCUMENT NUMBER
CD54AC/ACT00	CD74AC/ACT00	Quad 2-Input NAND Gate	14	1855
CD54AC/ACT02	CD74AC/ACT02	Quad 2-Input NOR Gate	14	1978
CD54AC/ACT04	CD74AC/ACT04	Hex Inverter/Buffer	14	1945
CD54AC/ACT05	CD74AC/ACT05	Hex Inverter/Buffer with Open-Drain Outputs	14	1945
CD54AC/ACT08	CD74AC/ACT08	Quad 2-Input AND Gate	14	1950
CD54AC/ACT10	CD74AC/ACT10	Triple 3-Input NAND Gate	14	1977
CD54AC/ACT14	CD74AC/ACT14	Hex Inverting Schmitt Trigger	14	1984
CD54AC/ACT20	CD74AC/ACT20	Dual 4-Input NAND Gate	14	1976
CD54AC/ACT32	CD74AC/ACT32	Quad 2-Input OR Gate	14	1951
CD54AC/ACT74	CD74AC/ACT74	Dual D Flip-Flop with Set and Reset	14	1881
CD54AC/ACT86	CD74AC/ACT86	Quad 2-Input Exclusive-OR Gate	14	1952
CD54AC/ACT109	CD74AC/ACT109	Dual J-K Flip-Flop with Set and Reset	16	1967
CD54AC/ACT112	CD74AC/ACT112	Dual J-K Flip-Flop with Set and Reset	16	1967
CD54AC/ACT138	CD74AC/ACT138	3-to-8-Line Decoder/Demultiplexer, Inverting	16	1909
CD54AC/ACT139	CD74AC/ACT139	Dual 2-to-4-Line Decoder/Demultiplexer	16	1953
CD54AC/ACT151	CD74AC/ACT151	8-Input Multiplexer	16	1980
CD54AC/ACT153	CD74AC/ACT153	Dual 4-Input Multiplexer	16	1966
CD54AC/ACT157	CD74AC/ACT157	Quad 2-Input Multiplexer	16	1910
CD54AC/ACT158	CD74AC/ACT158	Quad 2-Input Multiplexer, Inverting	16	1910
CD54AC/ACT161	CD74AC/ACT161	Synchronous 4-Bit Binary Counter, Asynchronous Reset	16	1959
CD54AC/ACT163	CD74AC/ACT163	Synchronous 4-Bit Binary Counter, Synchronous Reset	16	1959
CD54AC/ACT164	CD74AC/ACT164	8-Bit Serial-In/Parallel-Out Shift Register	14	1954
CD54AC/ACT174	CD74AC/ACT174	Hex D-Type Flip-Flop with Reset	16	1973
CD54AC/ACT175	CD74AC/ACT175	Quad D-Type Flip-Flop with Reset	16	1964
CD54AC/ACT191	CD74AC/ACT191	Synchronous 4-Bit Binary Up/Down Counter	16	1911
CD54AC/ACT193	CD74AC/ACT193	Synchronous 4-Bit Binary Up/Down Counter	16	1947
CD54AC/ACT238	CD74AC/ACT238	3-to-8-Line Decoder/Demultiplexer	16	1909
CD54AC/ACT240	CD74AC/ACT240	Octal Buffer/Line Driver, Three-State, Inverting	20	1856
CD54AC/ACT241	CD74AC/ACT241	Octal Buffer/Line Driver, Three-State	20	1856
CD54AC/ACT244	CD74AC/ACT244	Octal-Buffer/Line Driver, Three-State	20	1856
CD54AC/ACT245	CD74AC/ACT245	Octal-Bus Transceiver, Three-State	20	1907
CD54AC/ACT251	CD74AC/ACT251	8-Input Multiplexer, Three-State	16	1981
CD54AC/ACT253	CD74AC/ACT253	Dual 4-Input Multiplexer, Three-State	16	1985

AC/ACT SERIES (Continued)

CMOS LOGIC		DESCRIPTION	NUMBER OF LEADS	ANSWERFAX DOCUMENT NUMBER
CD54AC/ACT257	CD74AC/ACT257	Quad 2-Input Multiplexer, Three-State	16	1955
CD54AC/ACT258	CD74AC/ACT258	Quad 2-Input Multiplexer, Three-State	16	1955
CD54AC/ACT273	CD74AC/ACT273	Octal D-Type Flip-Flop with Reset	20	1979
CD54AC/ACT280	CD74AC/ACT280	8-Bit Odd/Even Parity Generator/Checker	14	1957
CD54AC/ACT283	CD74AC/ACT283	4-Bit Full Adder with Fast Carry	16	1912
CD54AC/ACT297	CD74AC/ACT297	Digital Phase-Locked Loop	16	2195
CD54AC/ACT299	CD74AC/ACT299	8-Bit Universal Shift Register, Three-State	20	1958
CD54AC/ACT323	CD74AC/ACT323	8-Bit Universal Shift Register, Three-State, (with Synchronous Reset)	20	1958
CD54AC/ACT373	CD74AC/ACT373	Octal Transparent Latch, Three-State	20	1882
CD54AC/ACT374	CD74AC/ACT374	Octal D Flip-Flop, Three-State	20	1883
CD54AC/ACT533	CD74AC/ACT533	Octal Transparent Latch, Three-State, Inverting	20	1882
CD54AC/ACT534	CD74AC/ACT534	Octal D Flip-Flop, Three-State, Inverting	20	1883
CD54AC/ACT540	CD74AC/ACT540	Octal Buffer/Line Driver, Three-State, Inverting	20	1857
CD54AC/ACT541	CD74AC/ACT541	Octal Buffer/Line Driver, Three-State	20	1857
CD54AC/ACT563	CD74AC/ACT563	Octal Inverting Transparent Latch, Three-State	20	1956
CD54AC/ACT564	CD74AC/ACT564	Octal D-Type Flip-Flop, Three-State, Inverting	20	1948
CD54AC/ACT573	CD74AC/ACT573	Octal Transparent Latch, Three-State	20	1956
CD54AC/ACT574	CD74AC/ACT574	Octal D-Type Flip-Flop, Three-State	20	1948
CD54AC/ACT623	CD74AC/ACT623	Octal-Bus Transceiver, Three-State, Non-Inverting	20	1968
CD54AC/ACT646	CD74AC/ACT646	Octal-Bus Transceiver/Register, Three-State	24	1970
CD54AC/ACT647	CD74AC/ACT647	Octal-Bus Transceiver/Register with Open Drain, Non-Inverting	24	1982
CD54AC/ACT648	CD74AC/ACT648	Octal Bus Transceiver/Register, Three-State, Inverting	24	1970
CD54AC/ACT651	CD74AC/ACT651	Octal-Bus Transceiver/Register, Three-State, Inverting	24	1974
CD54AC/ACT652	CD74AC/ACT652	Octal-Bus, Transceiver/Register, Three-State, Non-Inverting	24	1974
CD54AC/ACT653	CD74AC/ACT653	Octal-Bus Transceiver/Register; Open-Drain (A-Side); Three-State (B Side); Inverting	24	1975
CD54AC/ACT654	CD74AC/ACT654	Octal-Bus Transceiver/Register; Open-Drain (A-Side); Three-State (B Side); Non-Inverting	24	1975
CD54AC/ACT7060	CD74AC/ACT7060	14-Stage Binary Counter with Oscillator	20	2062
CD54AC/ACT7623	CD74AC/ACT7623	Octal-Bus Transceiver/Register; Open-Drain (A-Side); Three-State (B Side); Non-Inverting	20	1969

FCT SERIES

CMOS LOGIC		DESCRIPTION	NUMBER OF LEADS	ANSWERFAX DOCUMENT NUMBER
CD54FCT240	CD74FCT240	Octal Buffer/Line Driver, Three-State, Inverting	20	2227
CD54FCT241	CD74FCT241	Octal Buffer/Line Driver, Three-State	20	2227
CD54FCT244	CD74FCT244	Octal Buffer/Line Driver, Three-State	20	2227
CD54FCT245	CD74FCT245	Octal-Bus Transceiver, Three-State	20	2301
CD54FCT273	CD74FCT273	Octal D Flip-Flop with Reset	20	2303
CD54FCT373	CD74FCT373	Octal Transparent Latch, Three-State	20	2230
CD54FCT374	CD74FCT374	Octal D-Type Flip-Flop, Three-State	20	2305
CD54FCT533	CD74FCT533	Octal Transparent Latch, Three-State, Inverting	20	2230
CD54FCT540	CD74FCT540	Octal Buffer/Line Driver, Three-State, Inverting	20	2383
CD54FCT541	CD74FCT541	Octal Buffer/Line Driver, Three-State	20	2383
CD54FCT543	CD74FCT543	Octal Register/Transceiver, Three-State	24	2399
CD54FCT564	CD74FCT564	Octal D-Type Flip-Flop, Three-State, Inverting	20	2295
CD54FCT573	CD74FCT573	Octal Transparent Latch, Three-State	20	2304
CD54FCT574	CD74FCT574	Octal D-Type Flip-Flop, Three-State	20	2295
CD54FCT623	CD74FCT623	Octal Bus Transceiver, Three-State	20	2302
CD54FCT646	CD74FCT646	Octal Bus Transceiver/Register, Three-State	24	2393
CD54FCT651	CD74FCT651	Octal Bus Transceiver/Register, Three-State, Inverting	24	2394
CD54FCT652	CD74FCT652	Octal Bus Transceiver/Register, Three-State	24	2394
CD54FCT653	CD74FCT653	Octal Bus Transceiver/Register, Open-Drain (A Side), Three-State (B Side), Inverting	24	2403
CD54FCT654	CD74FCT654	Octal Bus Transceiver/Register, Open-Drain (A Side), Three-State (B Side)	24	2403
CD54FCT821A	CD74FCT821A	10-Bit D-Type Flip-Flop, Three-State	24	2390
CD54FCT822A	CD74FCT822A	10-Bit D-Type Flip-Flop, Three-State, Inverting	24	2390
CD54FCT823A	CD74FCT823A	9-Bit D-Type Flip-Flop, Three-State	24	2389
CD54FCT824A	CD74FCT824A	9-Bit D-Type Flip-Flop, Three-State, Inverting	24	2389
CD54FCT841A	CD74FCT841A	10-Bit Transparent Latch, Three-State	24	2397
CD54FCT842A	CD74FCT842A	10-Bit Transparent Latch, Three-State, Inverting	24	2397
CD54FCT843A	CD74FCT843A	9-Bit Transparent Latch, Three-State	24	2396
CD54FCT844A	CD74FCT844A	9-Bit Transparent Latch, Three-State, Inverting	24	2396
CD54FCT861A	CD74FCT861A	10-Bit Bus Transceiver, Three-State	24	2392
CD54FCT863A	CD74FCT863A	9-Bit Bus Transceiver, Three-State	24	2391
CD54FCT2952A	CD74FCT2952A	Octal Register/Transceiver, Three-State	24	2400
CD54FCT7623	CD74FCT7623	Octal Bus Transceiver, Three-State (B Side), Open-Drain (A Side)	20	2358

CD4000 SERIES

CMOS LOGIC	DESCRIPTION	NUMBER OF LEADS	ANSWERFAX DOCUMENT NUMBER
CD4001B	CMOS NOR Gate	14	985
CD4001UB	CMOS Quad 2-Input NOR Gate	14	945
CD4002B	CMOS NOR Gate	14	985
CD4006B	CMOS 18-Stage Static Shift Register	14	1033
CD4007UB	CMOS Dual Complementary Pair Plus Inverter	14	977
CD4008B	CMOS 4-Bit Full Adder	16	951
CD4009UB	CMOS Hex Buffer/Converter	16	940
CD4010B	CMOS Hex Buffer/Converter	16	940
CD4011B	CMOS NAND Gate	14	3718
CD4011UB	CMOS Quad 2-Input NAND Gate	14	947
CD4012B	CMOS NAND Gate	14	3718
CD4013B	CMOS Dual D-Type Flip-Flop	14	936
CD4014B	CMOS 8-Stage Static Shift Register	16	1043
CD4015B	CMOS Dual 4-Stage Static Shift Register	16	1024
CD4016B	CMOS Quad Bilateral Switch	14	953
CD4017B	CMOS Counter/Divider	16	1113
CD4018B	CMOS Presettable Divide-By-N Counter	16	1034
CD4019B	CMOS Quad AND/OR Select Gate	16	1045
CD4020B	CMOS Ripple-Carry Binary Counter/Divider (14 Stage)	16	1063
CD4021B	CMOS 8-Stage Static Shift Register	16	1043
CD4022B	CMOS Counter/Divider	16	1113
CD4023B	CMOS NAND Gate	14	3718
CD4024B	CMOS Ripple-Carry Binary Counter/Divider (7 Stage)	14	1063
CD4025B	CMOS NOR Gate	14	985
CD4026B	CMOS Decade Counter/Divider	16	1118
CD4027B	CMOS Dual J-K Master-Slave Flip-Flop	16	942
CD4028B	CMOS BCD-to-Decimal Decoder	16	1016
CD4029B	CMOS Presettable Up/Down Counter	16	1028
CD4030B	CMOS Quad Exclusive-OR Gate	14	1055
CD4031B	CMOS 64-Stage Static Shift Register	16	1073
CD4033B	CMOS Decade Counter/Divider	16	1118
CD4034B	CMOS 8-Stage Static Bidirectional Parallel/Serial Input/Output Bus Register	24	1062
CD4035B	CMOS 4-Stage Parallel-In/Parallel-Out Shift Register	16	1101
CD4040B	CMOS Ripple-Carry Binary Counter/Divider (12 Stage)	16	1063

CD4000 SERIES (Continued)

CMOS LOGIC	DESCRIPTION	NUMBER OF LEADS	ANSWERFAX DOCUMENT NUMBER
CD4041UB	CMOS Quad True/Complement Buffer	14	934
CD4042B	CMOS Quad Clocked D Latch	16	954
CD4043B	CMOS Quad Three-State R/S Latch	16	956
CD4044B	CMOS Quad Three-State R/S Latch	16	956
CD4045B	CMOS 21-Stage Counter	16	1119
CD4046B	CMOS Micropower Phase-Locked Loop	16	1099
CD4047B	CMOS Low-Power Monostable/Astable Multivibrator	14	1123
CD4048B	CMOS Multifunction Expandable 8-Input Gate	16	1124
CD4049UB	CMOS Hex Buffer/Converter	16	926
CD4050B	CMOS Hex Buffer/Converter	16	926
CD4051B	CMOS Analog Multiplexer/Demultiplexer	16	902
CD4052B	CMOS Analog Multiplexer/Demultiplexer	16	902
CD4053B	CMOS Analog Multiplexer/Demultiplexer	16	902
CD4054B	CMOS Liquid-Crystal Display Driver	16	634
CD4055B	CMOS Liquid-Crystal Display Driver	16	634
CD4056B	CMOS Liquid-Crystal Display Driver	16	634
CD4059A	CMOS Programmable Divide-By-N Counter	24	898
CD4060B	CMOS 14-Stage Ripple-Carry Binary Counter/Divider and Oscillator	16	1120
CD4063B	CMOS 4-Bit Magnitude Comparator	16	805
CD4066B	CMOS Quad Bilateral Switch	14	1114
CD4067B	CMOS Analog Multiplexer/Demultiplexer	24	3719
CD4068B	CMOS 8-Input NAND/AND Gate	14	809
CD4069UB	CMOS Hex Inverter	14	804
CD4070B	CMOS Quad Exclusive-OR Gate	14	910
CD4071B	CMOS OR Gate	14	807
CD4072B	CMOS OR Gate	14	807
CD4073B	CMOS AND Gate	14	806
CD4075B	CMOS OR Gate	14	807
CD4076B	CMOS 4-Bit D-Type Register	16	903
CD4077B	CMOS Quad Exclusive-NOR Gate	14	910
CD4078B	CMOS 8-Input NOR/OR Gate	14	810
CD4081B	CMOS AND Gate	14	806
CD4082B	CMOS AND Gate	14	806
CD4085B	CMOS Dual 2-Wide AND-OR-INVERT Gate	14	811

CD4000 SERIES (Continued)

CMOS LOGIC	DESCRIPTION	NUMBER OF LEADS	ANSWERFAX DOCUMENT NUMBER
CD4086B	CMOS Expandable 4-Wide 2-Input AND-OR-INVERT Gate	14	812
CD4089B	CMOS Binary Rate Multiplier	16	1003
CD4093B	CMOS Quad 2-Input NAND Schmitt Trigger	14	836
CD4094B	CMOS 8-Stage Shift-and-Store Bus Register	16	3707
CD4095B	CMOS Gated J-K Master-Slave Flip-Flop	14	879
CD4096B	CMOS Gated J-K Master-Slave Flip-Flop	14	879
CD4097B	CMOS Analog Multiplexer/Demultiplexer	24	3719
CD4098B	CMOS Dual Monostable Multivibrator	16	979
CD4099B	CMOS 8-Bit Addressable Latch	16	948
CD4502B	CMOS Strobed Hex Inverter/Buffer	16	1002
CD4503B	CMOS Hex Buffer	16	1224
CD4504B	CMOS Hex Voltage-Level Shifter for TTL-to-CMOS or CMOS-to-CMOS Operation	16	1846
CD4508B	CMOS Dual 4-Bit Latch	24	1009
CD4510B	CMOS Presettable Up/Down Counter	16	899
CD4511B	CMOS BCD-to-7-Segment Latch Decoder Driver	16	901
CD4512B	CMOS 8-Channel Data Selector	16	1032
CD4514B	CMOS 4-Bit Latch/4-to-16-Line Decoder	24	3721
CD4515B	CMOS 4-Bit Latch/4-to-16-Line Decoder	24	3721
CD4516B	CMOS Presettable Up/Down Counter	16	899
CD4517B	CMOS Dual 64-Stage Static Shift Register	16	1148
CD4518B	CMOS Dual Up Counter	16	808
CD4519B	CMOS 4-Bit AND/OR Selector, Quad 2-Channel Data Selector, or Quad Exclusive NOR Gate	16	1723
CD4520B	CMOS Dual Up Counter	16	808
CD4521B	CMOS 24-Stage Frequency Divider	16	1735
CD4522B	CMOS Programmable BCD Divide-By-N Counter	16	1710
CD4527B	CMOS BCD Rate Multiplier	16	1006
CD4529B	CMOS Dual 4-Channel Analog Data Selector	16	1720
CD4532B	CMOS 8-Bit Priority Encoder	16	876
CD4536B	CMOS Programmable Timer	16	1186
CD4541B	CMOS Programmable Timer	14	1378
CD4543B	CMOS BCD-to-7-Segment Latch/Decoder/Driver for Liquid-Crystal Display	16	1327
CD4555B	CMOS Dual Binary-to-1-to-4 Decoder/Demultiplexer	16	858
CD4556B	CMOS Dual Binary-to-1-to-4 Decoder/Demultiplexer	16	858

CD4000 SERIES (Continued)

CMOS LOGIC	DESCRIPTION	NUMBER OF LEADS	ANSWERFAX DOCUMENT NUMBER
CD4560B	CMOS NBCD Adder	16	1711
CD4566B	CMOS Industrial Time-Based Generator	16	1728
CD4572UB	CMOS Hex Gate	16	1704
CD4585B	CMOS 4-Bit Magnitude Comparator	16	1146
CD4724B	CMOS 8-Bit Addressable Latch	16	1111
CD7211	CMOS 4-Digit LCD Decoder/Driver	40	1725
CD7211A	CMOS 4-Digit LCD Decoder/Driver	40	1725
CD7211AM	CMOS 4-Digit LCD Decoder/Driver	40	1726
CD7211M	CMOS 4-Digit LCD Decoder/Driver	40	1726
CD14538B	CMOS Dual Precision Monostable Multivibrator	16	3737
CD22402	CMOS LSI Sync Generator	24	1686
CD22777	CMOS 32kHz Quartz Analog Clock Circuit	8	1869
CD40100B	CMOS 32-Stage Static Left/Right Shift Register	16	980
CD40102B	CMOS 8-Stage Presettable Synchronous Down Counter	16	984
CD40103B	CMOS 8-Stage Presettable Synchronous Down Counter	16	984
CD40105B	CMOS FIFO Register	16	1044
CD40106B	CMOS Hex Schmitt Trigger	14	1017
CD40107B	CMOS Dual 2-Input NAND Buffer/Driver	8, 14	1015
CD40109B	CMOS Quad Low-to-High Voltage Level Shifter	16	3722
CD40110B	CMOS Decade Up-Down Counter/Latch/Display Driver	16	1125
CD40116	CMOS High Speed 8-Bit Bidirectional CMOS/TTL Interfaced Level Converter	22	1234
CD40117B	Programmable Dual 4-Bit Terminator	14	1333
CD40147B	10-Line to 4-Line BCD Priority Encoder	16	1117
CD40160B	CMOS Synchronous Programmable 4-Bit Counter	16	1047
CD40161B	CMOS Synchronous Programmable 4-Bit Counter	16	1047
CD40163B	CMOS Synchronous Programmable 4-Bit Counter	16	1047
CD40174B	CMOS Hex D-Type Flip-Flop	16	1031
CD40175B	CMOS Quad D-Type Flip-Flop	16	1326
CD40192B	CMOS Presettable Up/Down Counter (Dual Clock with Reset)	16	993
CD40193B	CMOS Presettable Up/Down Counter (Dual Clock with Reset)	16	993
CD40194B	CMOS 4-Bit Bidirectional Universal Shift Register	16	1220
CD40257B	CMOS Quad 2-Line-to-1-Line Data Selector/Multiplexer	16	982

DC ELECTRICAL SPECIFICATIONS - HC SERIES For CD54HC/CD74HC Types

PARAMETERS	SYMBOL	TEST CONDITIONS				V_{CC} (V)	CD54HC/CD74HC AMBIENT TEMPERATURE, T_A (°C)						UNIT
							+25°C		-40°C TO +85°C		-55°C TO +125°C		
							MIN	MAX	MIN	MAX	MIN	MAX	
High Level Input Voltage	V_{IH}					2	1.5	-	1.5	-	1.5	-	V
						4.5	3.15	-	3.15	-	3.15	-	V
						6	4.2	-	4.2	-	4.2	-	V
Low Level Input Voltage	V_{IL}					2	-	0.5	-	0.5	-	0.5	V
						4.5	-	1.35	-	1.35	-	1.35	V
						6	-	1.8	-	1.8	-	1.8	V
		V_I	I_O STD	I_O BUS	I_O UNIT								
High Level Output Voltage	V_{OH} (Note 3)	V_{IH} or V_{IL}	-20	-20	µA	2	1.9	-	1.9	-	1.9	-	V
			-20	-20	µA	4.5	4.4	-	4.4	-	4.4	-	V
			-20	-20	µA	6	5.9	-	5.9	-	5.9	-	V
			-4	-6	mA	4.5	3.98	-	3.84	-	3.7	-	V
			-5.2	-7.8	mA	6	5.48	-	5.34	-	5.2	-	V
Low Level Output Voltage	V_{OL}	V_{IH} or V_{IL}	20	20	µA	2	-	0.1	-	0.1	-	0.1	V
			20	20	µA	4.5	-	0.1	-	0.1	-	0.1	V
			20	20	µA	6	-	0.1	-	0.1	-	0.1	V
			4	6	mA	4.5	-	0.26	-	0.33	-	0.4	V
			5.2	7.8	mA	6	-	0.26	-	0.33	-	0.4	V
Input Leakage Current	I_I (Note 4)	$V_I = V_{CC}$ or GND				6	-	±0.1	-	±1.0	-	±1.0	µA
Three-State Output Off-State Current	I_{OZ} (Note 5)	$V_I = V_{IH}$ or V_{IL} $V_O = V_{CC}$ or GND				6	-	±0.5	-	±5	-	±10	µA
Quiescent Supply Current SSI	I_{CC}	$V_I = V_{CC}$ or GND, $I_O = 0$				6	-	2	-	20	-	40	µA
Quiescent Supply Current FF						6	-	4	-	40	-	80	µA
Quiescent Supply Current MSI						6	-	8	-	80	-	160	µA

NOTES:

1. Unless otherwise specified, all voltages are referenced to Ground.
2. Except Schmitt trigger inputs.
3. Not applicable to open drain outputs.
4. For digital I/O pins use I_{OZ} limits.
5. Also applicable to open drain outputs.

DC ELECTRICAL SPECIFICATIONS - HCT SERIES For CD54HCT/CD74HCT Types

PARAMETERS	SYMBOL	TEST CONDITIONS				V_{CC} (V)	CD54HCT/CD74HCT AMBIENT TEMPERATURE, T_A (°C)						UNIT
							+25°C		-40°C TO +85°C		-55°C TO +125°C		
							MIN	MAX	MIN	MAX	MIN	MAX	
High Level Input Voltage	V_{IH}					4.5 to 5.5	2.0	-	2.0	-	2.0	-	V
Low Level Input Voltage	V_{IL}					4.5 to 5.5	-	0.8	-	0.8	-	0.8	V
		V_I	I_O STD	I_O BUS	I_O UNIT								
High Level Output Voltage	V_{OH} (Note 1)	V_{IH} or V_{IL}	-20	-20	µA	4.5	4.4	-	4.4	-	4.4	-	V
			-4	-6	mA	4.5	3.98	-	3.84	-	3.7	-	V
Low Level Output Voltage	V_{OL}	V_{IH} or V_{IL}	20	20	µA	4.5	-	0.1	-	0.1	-	0.1	V
			4	6	mA	4.5	-	0.26	-	0.33	-	0.4	V
Input Leakage Current	I_I (Note 2)	$V_I = V_{CC}$ or GND				5.5	-	±0.1	-	±1.0	-	±1.0	µA
Three-State Output Off-State Current	I_{OZ} (Note 3)	$V_I = V_{IH}$ or V_{IL} $V_O = V_{CC}$ or GND				5.5	-	±0.5	-	±5	-	±10	µA
Quiescent Supply Current SSI	I_{CC}	$V_I = V_{CC}$ or GND, $I_O = 0$				5.5	-	2	-	20	-	40	µA
Quiescent Supply Current FF						5.5	-	4	-	40	-	80	µA
Quiescent Supply Current MSI						5.5	-	8	-	80	-	160	µA
Additional Quiescent Device Current Per Input Pin: 1 Unit Load (Note 4)	ΔI_{CC}	$V_I = V_{CC}$ -2.4V				4.5 to 5.5	-	360	-	450	-	490	µA

NOTES:

1. Not applicable to open drain outputs.
2. For digital I/O pins use I_{OZ} limits.
3. Also applicable to open drain outputs.
4. Total Supply Current = $I_{CC} + \Sigma\Delta I_{CC}$.

AC SERIES STANDARD HARRIS AND JEDEC OUTPUT CHARACTERISTICS

PARAMETERS	SYMBOL	TEST CONDITIONS		V_{CC} (V)	AMBIENT TEMPERATURE, T_A (°C)						UNITS
					+25°C		-40°C TO +85°C		-55°C TO +125°C		
		V_I (V)	I_O (mA)		MIN	MAX	MIN	MAX	MIN	MAX	
High-Level Output Voltage	V_{OH}	V_{IH} or V_{IL}	-0.05	1.5	1.4	-	1.4	-	1.4	-	V
			-0.05	3	2.9	-	2.9	-	2.9	-	V
			-0.05 (Note 4)	4.5	4.4	-	4.4	-	4.4	-	V
			-4	3	2.58	-	2.48	-	2.4	-	V
			-24 (Note 4)	4.5	3.94	-	3.8	-	3.7	-	V
			-75 (Notes 1, 2, 4)	5.5	-	-	3.85	-	-	-	V
			-50 (Notes 1, 2, 4)	5.5	-	-	-	-	3.85	-	V

AC SERIES STANDARD HARRIS AND JEDEC OUTPUT CHARACTERISTICS (Continued)

PARAMETERS	SYMBOL	TEST CONDITIONS		V_{CC} (V)	AMBIENT TEMPERATURE, T_A (°C)						UNITS
					+25°C		-40°C TO +85°C		-55°C TO +125°C		
		V_I (V)	I_O (mA)		MIN	MAX	MIN	MAX	MIN	MAX	
Low-Level Output Voltage	V_{OL}	V_{IH} or V_{IL}	0.05	1.5	-	0.1	-	0.1	-	0.1	V
			0.05	3	-	0.1	-	0.1	-	0.1	V
			0.05 (Note 4)	4.5	-	0.1	-	0.1	-	0.1	V
			12	3	-	0.36	-	0.44	-	0.5	V
			24 (Note 4)	4.5	-	0.36	-	0.44	-	0.5	V
			75 (Notes 1, 2, 4)	5.5	-	-	-	1.65	-	-	V
			50 (Notes 1, 2, 4)	5.5	-	-	-	-	-	1.65	V

NOTES:

1. Test one output at a time for a 1s maximum duration. Measurement is made by forcing current and measuring voltage to minimize power dissipation.
2. Test verifies a minimum 50Ω transmission-line-drive capability at +85°C, 75Ω at +125°C.
3. Specifications at 1.5V are not part of the JEDEC proposal.
4. For ACT Series, specifications only at V_{CC} = 4.5V and 5.5V apply.

DC ELECTRICAL SPECIFICATIONS - AC SERIES

PARAMETERS	SYMBOL	TEST CONDITIONS		V_{CC} (V)	AMBIENT TEMPERATURE, T_A (°C)						UNITS
					+25°C		-40°C TO +85°C		-55°C TO +125°C		
		V_I (V)	I_O (mA)		MIN	MAX	MIN	MAX	MIN	MAX	
High-Level Input Voltage	V_{IH}			1.5	1.2	-	1.2	-	1.2	-	V
				3	2.1	-	2.1	-	2.1	-	V
				5.5	3.85	-	3.85	-	3.85	-	V
Low-Level Input Voltage	V_{IL}			1.5	-	0.3	-	0.3	-	0.3	V
				3	-	0.9	-	0.9	-	0.9	V
				5.5	-	1.65	-	1.65	-	1.65	V
High-Level Output Voltage	V_{OH}	V_{IH} or V_{IL}	-0.05	1.5	1.4	-	1.4	-	1.4	-	V
			-0.05	3	2.9	-	2.9	-	2.9	-	V
			-0.05	4.5	4.4	-	4.4	-	4.4	-	V
			-4	3	2.58	-	2.48	-	2.4	-	V
			-24	4.5	3.94	-	3.8	-	3.7	-	V
			-75 (Notes 4, 5)	5.5	-	-	3.85	-	-	-	V
			-50 (Notes 4, 5)	5.5	-	-	-	-	3.85	-	V

DC ELECTRICAL SPECIFICATIONS - AC SERIES (Continued)

PARAMETERS	SYMBOL	TEST CONDITIONS		V_{CC} (V)	AMBIENT TEMPERATURE, T_A (°C)						UNITS
					+25°C		-40°C TO +85°C		-55°C TO +125°C		
		V_I (V)	I_O (mA)		MIN	MAX	MIN	MAX	MIN	MAX	
Low-Level Output Voltage	V_{OL}	V_{IH} or V_{IL}	0.05	1.5	-	0.1	-	0.1	-	0.1	V
			0.05	3	-	0.1	-	0.1	-	0.1	V
			0.05	4.5	-	0.1	-	0.1	-	0.1	V
			12	3	-	0.36	-	0.44	-	0.5	V
			24	4.5	-	0.36	-	0.44	-	0.5	V
			75 (Notes 4, 5)	5.5	-	-	-	1.65	-	-	V
			50 (Notes 4, 5)	5.5	-	-	-	-	-	1.65	V
Input Leakage Current	I_I	V_{CC} or GND		5.5	-	±0.1	-	±1	-	±1	µA
Three-State Leakage Current (Note 6)	I_{OZ}	V_{IH} or V_{IL}, $V_O = V_{CC}$ or GND		5.5	-	±0.5	-	±5	-	±10	µA
Quiescent Supply Current, MSI (Note 7)	I_{CC}	V_{CC} or GND	0	5.5	-	8	-	80	-	160	µA

DC ELECTRICAL SPECIFICATIONS - ACT SERIES

PARAMETERS	SYMBOL	TEST CONDITIONS		V_{CC} (V)	AMBIENT TEMPERATURE, T_A (°C)						UNITS
					+25°C		-40°C TO +85°C		-55°C TO +125°C		
		V_I (V)	I_O (mA)		MIN	MAX	MIN	MAX	MIN	MAX	
High-Level Input Voltage	V_{IH}			4.5 to 5.5	2	-	2	-	2	-	V
Low-Level Input Voltage	V_{IL}			4.5 to 5.5	-	0.8	-	0.8	-	0.8	V
High-Level Output Voltage	V_{OH}	V_{IH} or V_{IL}	-0.05	4.5	4.4	-	4.4	-	4.4	-	V
			-24	4.5	3.94	-	3.8	-	3.7	-	V
			-75 (Notes 4, 5)	5.5	-	-	3.85	-	-	-	V
			-50 (Notes 4, 5)	5.5	-	-	-	-	3.85	-	V
Low-Level Output Voltage	V_{OL}	V_{IH} or V_{IL}	0.05	4.5	-	0.1	-	0.1	-	0.1	V
			24	4.5	-	0.36	-	0.44	-	0.5	V
			75 (Notes 4, 5)	5.5	-	-	-	1.65	-	-	V
			50 (Notes 4, 5)	5.5	-	-	-	-	-	1.65	V
Input Leakage Current	I_I	V_{CC} or GND		5.5	-	±0.1	-	±1	-	±1	µA

DC ELECTRICAL SPECIFICATIONS - ACT SERIES (Continued)

PARAMETERS	SYMBOL	TEST CONDITIONS		V_{CC} (V)	AMBIENT TEMPERATURE, T_A (°C)						UNITS
					+25°C		-40°C TO +85°C		-55°C TO +125°C		
		V_I (V)	I_O (mA)		MIN	MAX	MIN	MAX	MIN	MAX	
Three-State Leakage Current (Note 6)	I_{OZ}	V_{IH} or V_{IL}, $V_O = V_{CC}$ or GND		5.5	-	±0.5	-	±5	-	±10	µA
Quiescent Supply Current, MSI (Note 7)	I_{CC}	V_{CC} or GND	0	5.5	-	8	-	80	-	160	µA
Additional Supply Current per Input Pin, TTL Inputs High, 1 Unit Load	ΔI_{CC}	V_{CC} - 2.1		4.5 to 5.5	-	2.4	-	2.8	-	3	mA

NOTES:

1. Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied.
2. For up to 4 outputs per device; add ±25mA for each additional output.
3. Unless otherwise specified, all voltages are referenced to ground.
4. Test one output at a time for a 1s maximum duration. Measurement is made by forcing current and measuring voltage to minimize power dissipation.
5. Test verifies a minimum 50Ω transmission-line-drive capability at +85°C, 75Ω at +125°C.
6. Three-State devices only (off-state leakage current for open-drain types).
7. SSI/FF limits are 4µA at +25°C, 40µA at 0°C to +70°C, -40°C to +85°C, 80µA at -55°C to +125°C.

DC ELECTRICAL SPECIFICATIONS - FCT SERIES

74FCT Commercial Temperature Range, 0°C to +70°C, V_{CC} = 4.75V Min to 5.25V Max

For 54FCT Extended Industrial Temperature Range, -55°C to +125°C, V_{CC} = 4.5V Min to 5.5V Max

PARAMETERS	SYMBOL	TEST CONDITIONS		V_{CC} (V)	+25°C		0°C TO +70°C		-55°C TO +125°C		UNIT
		V_I (V)	I_O (mA)		MIN	MAX	MIN	MAX	MIN	MAX	
High Level Input Voltage	V_{IH}	-	-	4.5 to 5.5	2	-	2	-	2	-	V
Low Level Input Voltage	V_{IL}	-	-	4.5 to 5.5	-	0.8	-	0.8	-	0.8	V
High Level Output Voltage	V_{OH}	V_{IH} or V_{IL}	-15 (Note 4)	Min	2.4	-	2.4	-	-	-	V
			-12 (Note 4)	Min	2.4	-	-	-	2.4	-	V
Low Level Output Voltage	V_{OL}	V_{IH} or V_{IL}	64 (Note 4)	Min	-	0.55	-	0.55	-	-	V
			48 (Note 4)	Min	-	0.55	-	-	-	0.55	V
High Level Input Current	I_{IH}	V_{CC}	-	Max	-	0.1	-	1	-	1	µA
Low Level Input Current	I_{IL}	GND	-	Max	-	-0.1	-	-1	-	-1	µA
Three-State Leakage Current	I_{OZH}	V_{CC}	-	Max	-	0.5	-	10	-	10	µA
	I_{OZL}	GND	-	Max	-	-0.5	-	-10	-	-10	µA
Short Circuit Output Current (Note 2)	I_{OS}	V_{CC} or GND V_O = 0	-	Max	-60 (Note 4)	-	-60 (Note 4)	-	60 (Note 4)	-	mA
Input Clamp Voltage	V_{IK}	V_{CC} or GND	-18	Min	-	-1.2	-	-1.2	-	-1.2	V

DC ELECTRICAL SPECIFICATIONS - FCT SERIES (Continued)

74FCT Commercial Temperature Range, 0°C to +70°C, V_{CC} = 4.75V Min to 5.25V Max

For 54FCT Extended Industrial Temperature Range, -55°C to +125°C, V_{CC} = 4.5V Min to 5.5V Max

PARAMETERS	SYMBOL	TEST CONDITIONS		V_{CC} (V)	+25°C		0°C TO +70°C		-55°C TO +125°C		UNIT
		V_I (V)	I_O (mA)		MIN	MAX	MIN	MAX	MIN	MAX	
Quiescent Supply Current	I_{CC}	V_{CC} or GND	0	Max	-	8	-	80	-	500	µA
Additional Quiescent Supply Current per Input Pin, TTL Inputs High, 1 Unit Load	ΔI_{CC}	3.4 (Note 3)	-	Max	-	1.6	-	1.6	-	2	mA

NOTES:

1. Unless otherwise specified, all voltages are referenced to GND.
2. Not more than one output should be shorted at one time. Test duration should not exceed 100ms.
3. Inputs that are not measured are at V_{CC} or GND. FCT Input Loading: All inputs are 1 unit load. Unit load is ΔI_{CC} limit specified in DC Electrical Specifications Chart, e.g., 1.6mA Max at +70°C.
4. Values are for FCT240 types (See Table 4 for I_{OL} and I_{OH} for other types).

DC ELECTRICAL SPECIFICATION - CD4000 B-SERIES CMOS INTEGRATED CIRCUITS

JEDEC Standard

PARAMETERS	SYMBOL	TEST CONDITIONS	TEMP. RANGE	V_{DD} (V)	(NOTE 3) T_{LOW}		+25°C			(NOTE 4) T_{HIGH}		UNIT
					MIN	MAX	MIN	TYP	MAX	MIN	MAX	
Quiescent Device Current	I_{DD}	V_{IN} = V_{SS} or V_{DD} All Valid Input Combinations	Mil	5	-	0.25	-	-	0.25	-	7.5	µA
				10	-	0.5	-	-	0.5	-	15	µA
Gates				15	-	1	-	-	1	-	30	µA
			Comm	5	-	1	-	-	1	-	7.5	µA
				10	-	2	-	-	2	-	15	µA
				15	-	4	-	-	4	-	30	µA
Buffers, Flip-Flops	I_{DD}	V_{IN} = V_{SS} or V_{DD} All Valid Input Combinations	Mil	5	-	1	-	-	1	-	30	µA
				10	-	2	-	-	2	-	60	µA
				15	-	4	-	-	4	-	120	µA
			Comm	5	-	4	-	-	4	-	30	µA
				10	-	8	-	-	8	-	60	µA
				15	-	16	-	-	16	-	120	µA
MSI	I_{DD}	V_{IN} = V_{SS} or V_{DD} All Valid Input Combinations	Mil	5	-	5	-	-	5	-	150	µA
				10	-	10	-	-	10	-	300	µA
				15	-	20	-	-	20	-	600	µA
			Comm	5	-	20	-	-	20	-	150	µA
				10	-	40	-	-	40	-	300	µA
				15	-	80	-	-	80	-	600	µA
Low Level Output Voltage	V_{OL}	V_{IN} = V_{SS} or V_{DD} $\lvert I_O \rvert$ <1µA	All	5	-	0.05	-	-	0.05	-	0.05	V
				10	-	0.05	-	-	0.05	-	0.05	V
				15	-	0.05	-	-	0.05	-	0.05	V

DC ELECTRICAL SPECIFICATION - CD4000 B-SERIES CMOS INTEGRATED CIRCUITS

JEDEC Standard **(Continued)**

PARAMETERS	SYMBOL	TEST CONDITIONS	TEMP. RANGE	V_{DD} (V)	(NOTE 3) T_{LOW} MIN	(NOTE 3) T_{LOW} MAX	+25°C MIN	+25°C TYP	+25°C MAX	(NOTE 4) T_{HIGH} MIN	(NOTE 4) T_{HIGH} MAX	UNIT
High Level Output Voltage	V_{OH}	$V_{IN} = V_{SS}$ or V_{DD} $\|I_O\| < 1\mu A$	All	5	4.95	-	4.95	-	-	4.95	-	V
				10	9.95	-	9.95	-	-	9.95	-	V
				15	14.95	-	14.95	-	-	14.95	-	V
Input Low Voltage B Types	V_{IL}	$V_O = 0.5V$ or $4.5V$ $V_O = 1V$ or $9V$ $V_O = 1.5V$ or $13.5V$ $\|I_O\| < 1\mu A$	All	5	-	1.5	-	-	1.5	-	1.5	V
				10	-	3	-	-	3	-	3	V
				15	-	4	-	-	4	-	4	V
UB Types				5	-	1	-	-	1	-	1	V
				10	-	2	-	-	2	-	2	V
				15	-	2.5	-	-	2.5	-	2.5	V
Input High Voltage B Types	V_{IH}	$V_O = 0.5V$ or $4.5V$ $V_O = 1V$ or $9V$ $V_O = 1.5V$ or $13.5V$ $\|I_O\| < 1\mu A$	All	5	3.5	-	3.5	-	-	3.5	-	V
				10	7	-	7	-	-	7	-	V
				15	11	-	11	-	-	11	-	V
UB Types				5	4	-	4	-	-	4	-	V
				10	8	-	8	-	-	8	-	V
				15	12.5	-	12.5	-	-	12.5	-	V
Output Low (Sink) Current	I_{OL}	$V_O = 0.4V$ $V_{IN} = 0V$ or $5V$ $V_O = 0.5V$ $V_{IN} = 0V$ or $10V$ $V_O = 1.5V$ $V_{IN} = 0V$ or $15V$	Mil	5	0.64	-	0.51	-	-	0.36	-	mA
				10	1.6	-	1.3	-	-	0.9	-	mA
				15	4.2	-	3.4	-	-	2.4	-	mA
			Comm	5	0.52	-	0.44	-	-	0.36	-	mA
				10	1.3	-	1.1	-	-	0.9	-	mA
				15	3.6	-	3.0	-	-	2.4	-	mA
Output High (Source) Current	I_{OH}	$V_O = 4.6V$ $V_{IN} = 0V$ or $5V$ $V_O = 9.5V$ $V_{IN} = 0V$ or $10V$ $V_O = 13.5V$ $V_{IN} = 0V$ or $15V$	Mil	5	-0.25	-	-0.2	-	-	-0.14	-	mA
				10	-0.62	-	-0.5	-	-	-0.35	-	mA
				15	-1.8	-	-1.5	-	-	-1.1	-	mA
			Comm	5	-0.2	-	-0.16	-	-	-0.12	-	mA
				10	-0.5	-	-0.4	-	-	-0.3	-	mA
				15	-1.4	-	-1.2	-	-	-1.0	-	mA
Input Current	I_{IN}	$V_{IN} = 0V$ or $15V$	Mil	15	-	±0.1	-	-	±0.1	-	±1	µA
		$V_{IN} = 0V$ or $15V$	Comm	15	-	±0.3	-	-	±0.3	-	±1	µA
Three-State Output Leakage Current	I_{OUT} Max	$V_{IN} = 0V$ or $15V$	Mil	15	-	±0.4	-	-	±0.4	-	±12	µA
		$V_{IN} = 0V$ or $15V$	Comm	15	-	±1.6	-	-	±1.6	-	±12	µA
Input Capacitance Per Unit Load	C_{IN}	Any Input	All	-	-	-	-	-	7.5	-	-	pF

NOTES:

1. Voltages referenced to V_{SS}.
2. Reprinted from JEDEC Standard No. 13-B, "JEDEC Standard Specification for Description of B-Series CMOS Devices".
3. T_{LOW} = -55°C for Military Temperature Range Device, -40°C for Commercial Temperature Device (All Harris Devices).
4. T_{HIGH} = +125°C for Military Temperature Range Device, +85°C for Commercial Temperature Range Device.

STANDARDIZED DC ELECTRICAL SPECIFICATION - CD4000 B-SERIES CMOS INTEGRATED CIRCUITS

PARAMETERS	SYMBOL	TEST CONDITIONS			LIMITS				+25°C			UNIT
		V_O (V)	V_{IN} (V)	V_{DD} (V)	-55°C	-40°C	+85°C	+125°C	MIN	TYP	MAX	
Quiescent Device Current	I_{DD} Max	-	0, 5	5	0.25	0.25	7.5	7.5	-	0.01	0.25	µA
		-	0, 10	10	0.5	0.5	15	15	-	0.01	0.5	µA
Gates, Inverters (Note 1)		-	0, 15	15	1	1	30	30	-	0.01	1	µA
		-	0, 20	20	5	5	150	150	-	0.02	5	µA
Buffers, Flip-Flops, Latches, Multi-Level Gates (MSI-1 Types) (Note 1)		-	0, 5	5	1	1	30	30	-	0.02	1	µA
		-	0, 10	10	2	2	60	60	-	0.02	2	µA
		-	0, 15	15	4	4	120	120	-	0.02	4	µA
		-	0, 20	20	20	20	600	600	-	0.04	20	µA
Complex Logic (MSI-2 Types) (Note 1)		-	0, 5	5	5	5	150	150	-	0.04	5	µA
		-	0, 10	10	10	10	300	300	-	0.04	10	µA
		-	0, 15	15	20	20	600	600	-	0.04	20	µA
		-	0, 20	20	100	100	3000	3000	-	0.08	100	µA
Output Low (Sink) Current Min	I_{OL} Min	0.4	0, 5	5	0.64	0.61	0.42	0.36	0.51	1	-	mA
		0.5	0, 10	10	1.6	1.5	1.1	0.9	1.3	2.6	-	mA
		1.5	0, 15	15	4.2	4	2.8	2.4	3.4	6.8	-	mA
Output High (Source) Current, Min	I_{OH} Min	4.6	0, 5	5	-6.4	-0.61	-0.42	-0.36	-0.51	-1	-	mA
		2.5	0, 5	5	-2	-1.8	-1.3	-1.15	-1.6	-3.2	-	mA
		9.5	0, 10	10	-1.6	-1.5	-1.1	-0.9	-1.3	-2.6	-	mA
		13.5	0, 15	15	-4.2	-4	-2.8	-2.4	-3.4	-6.8	-	mA
Output Voltage Low-Level	V_{OL} Max	-	0, 5	5	0.05				-	0	0.05	V
		-	0, 10	10	0.05				-	0	0.05	V
		-	0, 15	15	0.05				-	0	0.05	V
Output Voltage High-Level	V_{OH} Min	-	0, 5	5	4.95				4.95	5	-	V
		-	0, 10	10	9.95				9.95	10	-	V
		-	0, 15	15	14.95				14.95	15	-	V
Input Low Voltage	V_{IL} Max	0.5, 4.5	-	5	1.5				-	-	1.5	V
		1, 9	-	10	3				-	-	3	V
B Types		1.5, 13.5	-	15	4				-	-	4	V
UB Types		0.5, 4.5	-	5	1				-	-	1	V
		1, 9	-	10	2				-	-	2	V
		1.5, 13.5	-	15	2.5				-	-	2.5	V
Input High Voltage	V_{IH} Max	0.5, 4.5	-	5	3.5				3.5	-	-	V
		1, 9	-	10	7				7	-	-	V
B Types		1.5, 13.5	-	15	11				11	-	-	V
UB Types		0.5, 4.5	-	5	4				4	-	-	V
		1, 9	-	10	8				8	-	-	V
		1.5, 13.5	-	15	12.5				12.5	-	-	V
Input Current	I_{IN} Max	-	0, 18	18	±0.1	±0.1	±1	±1	-	$±10^{-5}$	±0.1	µA
Three-State Output Leakage Current	I_{OUT} Max	0, 18	0, 18	18	±0.4	±0.4	±12	±12	-	$±10^{-4}$	±0.4	µA

NOTE:

1. Classifications of Harris CMOS B-Series types are shown in Table 1.

Hi-Rel High Speed CMOS Logic ICs - HC/HCT Series Selection Guide

HIGH SPEED CMOS LOGIC ICS - HC/HCT SERIES SELECTION GUIDE

TYPE NUMBER		DESCRIPTION	(NOTE 1) NUMBER OF LEADS	CLASSIFICATION	ANSWERFAX DOCUMENT NUMBER
CMOS LOGIC	TTL LOGIC				
CD54HC00/3A	CD54HCT00/3A	Quad 2-Input NAND Gate	14	SSI	3753
CD54HC02/3A	CD54HCT02/3A	Quad 2-Input NOR Gate	14	SSI	3754
CD54HC03/3A	CD54HCT03/3A	Quad 2-Input NAND Gate with Open Drain	14	SSI	3755
CD54HC04/3A	CD54HCT04/3A	Hex Inverter	14	SSI	3756
CD54HC08/3A	CD54HCT08/3A	Quad 2-Input AND Gate	14	SSI	3757
CD54HC10/3A	CD54HCT10/3A	Triple 3-Input NAND Gate	14	SSI	3758
CD54HC11/3A	CD54HCT11/3A	Triple 3-Input AND Gate	14	SSI	3759
CD54HC14/3A	CD54HCT14/3A	Hex Inverting Schmitt Trigger	14	SSI	3760
CD54HC20/3A	CD54HCT20/3A	Dual 4-Input NAND Gate	14	SSI	3761
CD54HC21/3A	CD54HCT21/3A	Dual 4-Input AND Gate	14	SSI	3762
CD54HC27/3A	CD54HCT27/3A	Triple 3-Input NOR Gate	14	SSI	3763
CD54HC30/3A	CD54HCT30/3A	8-Input NAND Gate	14	SSI	3764
CD54HC32/3A	CD54HCT32/3A	Quad 2-Input OR Gate	14	SSI	3765
CD54HC42/3A	CD54HCT42/3A	BCD-to-Decimal Decoder (1-to-10)	16	MSI	3766
CD54HC73/3A	-	Dual J-K Flip-Flop with Reset	14	FF	3767
CD54HC74/3A	CD54HCT74/3A	Dual D Flip-Flop with Set and Reset	14	FF	3768
CD54HC75/3A	CD54HCT75/3A	Quad Bistable Transparent Latch	16	FF	3769
CD54HC85/3A	CD54HCT85/3A	4-Bit Magnitude Comparator	16	MSI	3770
CD54HC86/3A	CD54HCT86/3A	Quad 2-Input EXCLUSIVE-OR Gate	14	SSI	3771
CD54HC107/3A	CD54HCT107/3A	Dual J-K Flip-Flop with Reset	14	FF	3772
CD54HC109/3A	CD54HCT109/3A	Dual J-K Flip-Flop with Set and Reset	16	FF	3773
CD54HC112/3A	CD54HCT112/3A	Dual J-K Flip-Flop with Set and Reset	16	FF	3774
CD54HC123/3A	CD54HCT123/3A	Dual Retriggerable Monostable Multivibrator with Reset	16	MSI	3775
CD54HC125/3A	CD54HCT125/3A	Quad Three-State Buffer	14	MSI	3776
CD54HC126/3A	CD54HCT126/3A	Quad Three-State Buffer	14	MSI	3777
CD54HC132/3A	CD54HCT132/3A	Quad 2-Input NAND Schmitt Trigger	14	SSI	3778
CD54HC138/3A	CD54HCT138/3A	3-to-8-Line Decoder/DeMUX, Inverting	16	MSI	3779
CD54HC139/3A	CD54HCT139/3A	Dual 2-of-4-Line Decoder/DeMUX	16	MSI	3780
CD54HC147/3A	-	10-to-4-Line Priority Encoder	16	MSI	3781
CD54HC151/3A	CD54HCT151/3A	8-Input MUX	16	MSI	3782
CD54HC153/3A	CD54HCT153/3A	Dual 4-Input MUX	16	MSI	3783
CD54HC154/3A	CD54HCT154/3A	4-to-16-Line Decoder/DeMUX	24	MSI	3784
CD54HC157/3A	CD54HCT157/3A	Quad 2-Input MUX	16	MSI	3785

HIGH SPEED CMOS LOGIC ICS - HC/HCT SERIES SELECTION GUIDE (Continued)

TYPE NUMBER		DESCRIPTION	(NOTE 1) NUMBER OF LEADS	CLASSIFICATION	ANSWERFAX DOCUMENT NUMBER
CMOS LOGIC	TTL LOGIC				
CD54HC158/3A	CD54HCT158/3A	Quad 2-Input MUX, Inverting	16	MSI	3786
CD54HC160/3A	CD54HCT160/3A	Synchronous BCD Decade Counter, Asynchronous Reset	16	MSI	3787
CD54HC161/3A	CD54HCT161/3A	Synchronous 4-Bit Binary Counter, Asynchronous Reset	16	MSI	3788
CD54HC162/3A	CD54HCT162/3A	Synchronous BCD Decade Counter, Synchronous Reset	16	MSI	3789
CD54HC163/3A	CD54HCT163/3A	Synchronous 4-Bit Binary Counter, Synchronous Reset	16	MSI	3790
CD54HC164/3A	CD54HCT164/3A	8-Bit Serial-In/Parallel-Out Shift Register	14	MSI	3791
CD54HC165/3A	CD54HCT165/3A	8-Bit Parallel-In/Serial-Out Shift Register	16	MSI	3792
CD54HC166/3A	CD54HCT166/3A	8-Bit Parallel-In/Serial-Out Shift Register	16	MSI	3793
CD54HC173/3A	CD54HCT173/3A	Quad D-Type Flip-Flop, Three-State	16	MSI	3794
CD54HC174/3A	CD54HCT174/3A	Hex D-Type Flip-Flop with Reset	16	MSI	3795
CD54HC175/3A	CD54HCT175/3A	Quad D-Type Flip-Flop with Reset	16	MSI	3796
CD54HC190/3A	-	Presettable Synchronous BCD Decade Up/Down Counter	16	MSI	3797
CD54HC191/3A	CD54HCT191/3A	Presettable Synchronous Up/Down Counter	16	MSI	3798
CD54HC192/3A	-	Synchronous BCD Decade Up/Down Counter	16	MSI	3799
CD54HC193/3A	CD54HCT193/3A	Synchronous 4-Bit Binary Up/Down Counter	16	MSI	3800
CD54HC194/3A	-	4-Bit Bidirectional Universal Shift Register	16	MSI	3801
CD54HC195/3A	-	4-Bit Parallel Access Shift Register	16	MSI	3802
CD54HC221/3A	-	Dual Monostable Multivibrator with Reset	16	MSI	3803
CD54HC237/3A	-	3-to-8-Line Decoder/MUX with Address Latches	16	MSI	3804
CD54HC238/3A	CD54HCT238/3A	3-to-8-Line Decoder/DeMUX	16	MSI	3805
CD54HC240/3A	CD54HCT240/3A	Octal Buffer/Line Driver, Three-State, Inverting	20	MSI	3806
-	CD54HCT241/3A	Octal Buffer/Line Driver, Three-State	20	MSI	3807
CD54HC243/3A	CD54HCT243/3A	Quad Bus Transceiver, Three-State	14	MSI	3808
CD54HC244/3A	CD54HCT244/3A	Octal Buffer/Line Driver, Three-State	20	MSI	3809
CD54HC245/3A	CD54HCT245/3A	Octal Bus Transceiver, Three-State	20	MSI	3810
CD54HC251/3A	CD54HCT251/3A	8-Input MUX, Three-State	16	MSI	3811
CD54HC253/3A	-	Dual 4-Input MUX, Three-State	16	MSI	3812
CD54HC257/3A	CD54HCT257/3A	Quad 2-Input MUX, Three-State	16	MSI	3813
-	CD54HCT258/3A	Quad 2-Line-to-4-Line Data Selector	16	MSI	3814
CD54HC259/3A	CD54HCT259/3A	8-Bit Addressable Latch	16	MSI	3815
CD54HC273/3A	CD54HCT273/3A	Octal D-Type Flip-Flop with Reset	20	MSI	3816
CD54HC280/3A	CD54HCT280/3A	9-Bit Odd/Even Parity Generator/Checker	14	MSI	3817
CD54HC283/3A	CD54HCT283/3A	4-Bit Full Adder with Fast Carry	16	MSI	3818

HIGH SPEED CMOS LOGIC ICS - HC/HCT SERIES SELECTION GUIDE (Continued)

TYPE NUMBER		DESCRIPTION	(NOTE 1) NUMBER OF LEADS	CLASSIFICATION	ANSWERFAX DOCUMENT NUMBER
CMOS LOGIC	TTL LOGIC				
CD54HC297/3A	-	Digital Phase-Locked-Loop	16	MSI	3819
CD54HC299/3A	CD54HCT299/3A	8-Bit Universal Shift Register, Three-State	20	MSI	3820
CD54HC354/3A	-	8-Input MUX/Register, Three-State	20	MSI	3821
CD54HC356/3A	-	8-Input MUX/Register, Three-State	20	MSI	3822
CD54HC365/3A	CD54HCT365/3A	Hex Buffer/Line Driver, Three-State	16	MSI	3823
CD54HC366/3A	CD54HCT366/3A	Hex Buffer/Line Driver, Three-State, Inverting	16	MSI	3824
CD54HC367/3A	CD54HCT367/3A	Hex Buffer/Line Driver, Three-State	16	MSI	3825
CD54HC368/3A	-	Hex Buffer/Line Driver, Three-State, Inverting	16	MSI	3826
CD54HC373/3A	CD54HCT373/3A	Octal Transparent Latch, Three-State	20	MSI	3827
CD54HC374/3A	CD54HCT374/3A	Octal D-Type Flip-Flop, Three-State	20	MSI	3828
CD54HC377/3A	CD54HCT377/3A	Octal D-Type Flip-Flop with Data Enable	20	MSI	3829
-	CD54HCT390/3A	Dual Decade Ripple Counter	16	MSI	3830
CD54HC393/3A	CD54HCT393/3A	Dual 4-Bit Binary Ripple Counter	14	MSI	3831
-	CD54HCT423/3A	Dual Retriggerable Monostable Multivibrator with Reset	16	MSI	3832
CD54HC533/3A	CD54HCT533/3A	Octal Transparent Latch, Three-State, Inverting	20	MSI	3833
CD54HC534/3A	CD54HCT534/3A	Octal D-Type Flip-Flop, Three-State, Inverting	20	MSI	3834
CD54HC540/3A	-	Octal Buffer/Line Driver, Three-State, Inverting	20	MSI	3835
CD54HC541/3A	CD54HCT541/3A	Octal Buffer/Line Driver, Three-State	20	MSI	3836
CD54HC563/3A	-	Octal Transparent Latch, Three-State, Inverting	20	MSI	3837
CD54HC564/3A	CD54HCT564/3A	Octal D-Type Flip-Flop, Three-State, Inverting	20	MSI	3838
CD54HC573/3A	CD54HCT573/3A	Octal Transparent Latch, Three-State	20	MSI	3839
CD54HC574/3A	CD54HCT574/3A	Octal D-Type Flip-Flop, Three-State	20	MSI	3840
CD54HC597/3A	-	8-Bit Shift Register with I/P Latch	16	MSI	3841
CD54HC640/3A	CD54HCT640/3A	Octal Bus Transceiver, Three-State, Inverting	20	MSI	3842
CD54HC646/3A	CD54HCT646/3A	Octal Bus Transceiver/Register, Three-State	24	MSI	3843
CD54HC670/3A	CD54HCT670/3A	4 X 4 Register File, Three-State	16	MSI	3844
CD54HC688/3A	CD54HCT688/3A	8-Bit Magnitude Comparator	20	MSI	3845
CD54HC4002/3A	-	Dual 4-Input NOR Gate	14	SSI	3846
CD54HC4015/3A	-	Dual 4-Bit Serial-In/Parallel-Out Shift Register	16	MSI	3847
CD54HC4017/3A	CD54HCT4017/3A	Johnson Decade Counter with 10 Decoded Outputs	16	MSI	3848
CD54HC4020/3A	CD54HCT4020/3A	14-Stage Binary Ripple Counter	16	MSI	3849
CD54HC4024/3A	CD54HCT4024/3A	7-Stage Binary Ripple Counter	14	MSI	3850
CD54HC4040/3A	CD54HCT4040/3A	12-Bit Binary Ripple Counter	16	MSI	3851
CD54HC4046A/3A	CD54HCT4046A/3A	Phase-Locked Loop with VCO	16	MSI	3852
CD54HC4049/3A	-	Hex Inverting HIGH-to-LOW Level Shifter	16	SSI	3853

HIGH SPEED CMOS LOGIC ICS - HC/HCT SERIES SELECTION GUIDE (Continued)

TYPE NUMBER		DESCRIPTION	(NOTE 1) NUMBER OF LEADS	CLASSIFICATION	ANSWERFAX DOCUMENT NUMBER
CMOS LOGIC	TTL LOGIC				
CD54HC4050/3A	-	Hex HIGH-to-LOW Level Shifter	16	SSI	3854
CD54HC4051/3A	CD54HCT4051/3A	8-Channel Analog MUX/DeMUX	16	MSI	3855
CD54HC4052/3A	CD54HCT4052/3A	Dual 4-Channel Analog MUX/DeMUX	16	MSI	3856
CD54HC4053/3A	CD54HCT4053/3A	Triple 2-Channel Analog MUX/ DeMUX	16	MSI	3857
CD54HC4059/3A	CD54HCT4059/3A	Programmable Divided-by-"N" Counter	24	MSI	3858
CD54HC4060/3A	CD54HCT4060/3A	14-Stage Binary Ripple Counter with Oscillator	16	MSI	3859
CD54HC4066/3A	-	Quad Bilateral Switch	14	SSI	3860
CD54HC4075/3A	CD54HCT4075/3A	Triple 3-Input OR Gate	14	SSI	3861
CD54HC4094/3A	-	8-Stage Shift-and-Store Bus Register	16	MSI	3862
CD54HC4316/3A	-	Quad Analog Switch	16	MSI	3863
CD54HC4351/3A	-	Analog MUX with Latch	20	MSI	3864
CD54HC4511/3A	-	BCD-to-7-Segment Latch/Decoder/Driver	16	MSI	3865
CD54HC4514/3A	-	4-to-16-Line Decoder/DeMUX with Input Latches	24	MSI	3866
CD54HC4515/3A	-	4-to-16-Line Decoder with Input Latches	24	MSI	3867
CD54HC4516/3A	-	Up/Down Counter, Binary	16	MSI	3868
CD54HC4520/3A	CD54HCT4520/3A	Dual 4-Bit Synchronous Binary Counter	16	MSI	3869
CD54HC4538/3A	CD54HCT4538/3A	Dual Precision Monostable Multivibrator	16	MSI	3870
CD54HC7266/3A	-	Quad Exclusive NOR	14	SSI	3871
-	CD54HCT40102/3A	8-Bit Synchronous BCD Down Counter	16	MSI	3872
CD54HC40103/3A	-	8-Bit Binary Down Counter	16	MSI	3873
CD54HC40105/3A	CD54HCT40105/3A	4-Bits x 16 Words FIFO Register	16	MSI	3874
CD54HCU04/3A	-	Hex Inverter (Unbuffered)	14	SSI	3875

NOTE:

1. These lead counts are for dual-in-line packages only.

Hi-Rel High Speed CMOS Logic ICs - HC/HCT Series Cross Reference Guide

HARRIS SMD AND DESC CROSS REFERENCE GUIDE, DIGITAL - LOGIC CD54HC/HCT

CMOS LOGIC HARRIS DEVICE	MILITARY REFERENCE	TTL LOGIC HARRIS DEVICE	MILITARY REFERENCE	DESCRIPTION
CD54HC00/3A	8403701CA	CD54HCT00/3A	5962-8683101CA	Quad 2-Input NAND Gate
CD54HC02/3A	8404101CA	CD54HCT02/3A	5962-8975101CA	Quad 2-Input NOR Gate
CD54HC03/3A	5962-8764701CA	-	-	Quad 2-Input NAND Gate with Open Drain
CD54HC04/3A	8409801CA	CD54HCT04/3A	5962-8974701CA	Hex Inverter
CD54HC08/3A	8404701CA	CD54HCT08/3A	5962-8688301CA	Quad 2-Input AND Gate
CD54HC10/3A	8403801CA	CD54HCT10/3A	5962-8984301CA	Triple 3-Input NAND Gate
CD54HC11/3A	8404801CA	CD54HCT11/3A	5962-8970901CA	Triple 3-Input AND Gate
CD54HC14/3A	8409101CA	CD54HCT14/3A	5962-8689001CA	Hex Inverting Schmitt Trigger
CD54HC20/3A	8403901CA	-	-	Dual 4-Input NAND Gate
CD54HC21/3A	5962-8857601CA	-	-	Dual 4-Input AND Gate
CD54HC27/3A	8404201CA	CD54HCT27/3A	5962-8970301CA	Triple 3-Input NOR Gate
CD54HC30/3A	8404001CA	CD54HCT30/3A	5962-8974601CA	8-Input NAND Gate
CD54HC32/3A	8404501CA	CD54HCT32/3A	5962-8685201CA	Quad 2-Input OR Gate
CD54HC42/3A	5962-8682101EA	-	-	BCD-to-Decimal Decoder (1-to-10)
CD54HC73/3A	5962-8515301CA	-	-	Dual J-K Flip-Flop with Reset
CD54HC74/3A	8405601CA	CD54HCT74/3A	5962-8685301CA	Dual D Flip-Flop with Set and Reset
CD54HC75/3A	8407001EA	CD54HCT75/3A	5962-9075801MEA	Quad Bistable Transparent Latch
CD54HC85/3A	8601301EA	CD54HCT85/3A	5962-8867201EA	4-Bit Magnitude Comparator
CD54HC86/3A	8404601CA	CD54HCT86/3A	5962-8984401CA	Quad 2-Input Exclusive OR Gate
CD54HC107/3A	5962-8515401CA	CD54HCT107/3A	5962-9084901MCA	Dual J-K Flip-Flop with Reset
CD54HC109/3A	8415001EA	CD54HCT109/3A	5962-9070101MEA	Dual J-K Flip-Flop with Set and Reset
CD54HC112/3A	8408801EA	CD54HCT112/3A	5962-8970201EA	Dual J-K Flip-Flop with Set and Reset
CD54HC123/3A	5962-8684701EA	CD54HCT123/3A	5962-8970001EA	Dual Retriggerable Monostable Multivibrator with Reset
CD54HC125/3A	5962-8772101CA	-	-	Quad Three-State Buffer
CD54HC126/3A	5962-8684801CA	CD54HCT126/3A	5962-9065101MCA	Quad Three-State Buffer
-	-	CD54HCT132/3A	5962-8984501CA	Quad 2-Input NAND Schmitt Trlgger
CD54HC138/3A	8406201EA	CD54HCT138/3A	8550401EA	3-to-8-Line Decoder/DeMUX, Inverting
CD54HC139/3A	8409201EA	-	-	Dual 2-of-4-Line Decoder/DeMUX
CD54HC147/3A	8406401EA	-	-	10-to-4-Line Priority Encoder
CD54HC151/3A	8412801EA	CD54HCT151/3A	5962-9065201MEA	8-Input MUX
CD54HC153/3A	8409301EA	CD54HCT153/3A	5962-9050501MEA	Dual 4-Input MUX
CD54HC154/3A	5962-8682201JA	CD54HCT154/3A	5962-8670101JA	4-to-16-Line Decoder/DeMUX
CD54HC157/3A	5962-8606101EA	CD54HCT157/3A	5962-9070201MEA	Quad 2-Input MUX
CD54HC158/3A	5962-8682301EA	CD54HCT158/3A	5962-9070301MEA	Quad 2-Input MUX Inverting
CD54HC160/3A	5962-8682401EA	CD54HCT160/3A	5962-9070501MEA	Synchronous BCD Decade Counter, Asynchronous Reset
CD54HC161/3A	8407501EA	CD54HCT161/3A	5962-8685401EA	Synchronous 4-Bit Binary Counter, Asynchronous Reset

HARRIS SMD AND DESC CROSS REFERENCE GUIDE, DIGITAL - LOGIC CD54HC/HCT (Continued)

CMOS LOGIC HARRIS DEVICE	MILITARY REFERENCE	TTL LOGIC HARRIS DEVICE	MILITARY REFERENCE	DESCRIPTION
CD54HC162/3A	8409401EA	CD54HCT162/3A	5962-8970701EA	Synchronous BCD Decade Counter, Synchronous Reset
CD54HC163/3A	8607601EA	-	-	Synchronous 4-Bit Binary Counter, Synchronous Reset
CD54HC164/3A	8416201CA	CD54HCT164/3A	5962-8970401CA	8-Bit Serial-In/Parallel-Out Shift Register
CD54HC165/3A	8409501EA	CD54HCT165/3A	5962-8685501EA	8-Bit Parallel-In/Serial-Out Shift Register
CD54HC173/3A	5962-8682501EA	CD54HCT173/3A	5962-8875901EA	Quad D-Type Flip-Flop, Three-State
CD54HC174/3A	8407301EA	CD54HCT174/3A	5962-8974301EA	Hex D-Type Flip-Flop with Reset
CD54HC175/3A	8408901EA	CD54HCT175/3A	5962-8970101EA	Quad D-Type Flip-Flop with Reset
CD54HC190/3A	5962-8994601EA	-	-	Presettable SYN BCD Up/Down Counter
CD54HC191/3A	5962-8689101EA	CD54HCT191/3A	5962-8867101EA	Synchronous 4-Bit Binary Up/Down Counter
CD54HC192/3A	5962-8780801EA	-	-	Synchronous BCD Decade Up/Down Counter
CD54HC193/3A	5962-8772401EA	CD54HCT193/3A	5962-9084801MEA	Synchronous 4-Bit Binary Up/Down Counter
CD54HC194/3A	5962-8682601EA	-	-	4-Bit Bidirectional Universal Shift Register
CD54HC195/3A	5962-8682701EA	-	-	4-Bit Parallel Access Shift Register
CD54HC221/3A	5962-8780501EA	-	-	Dual Monostable Multivibrator with Reset
CD54HC237/3A	5962-8860601EA	-	-	3-to-8-Line Decoder with Latch
CD54HC238/3A	5962-8688401EA	CD54HCT238/3A	5962-8974501EA	3-to-8-Line Decoder/DeMUX
CD54HC240/3A	8407401RA	CD54HCT240/3A	8550501RA	Octal Buffer/Line Driver, Three-State, Inverting
CD54HC243/3A	8409001CA	-	-	Quad Bus Transceiver, Three-State
CD54HC244/3A	8409601RA	CD54HCT244/3A	8513001RA	Octal Buffer/Line Driver, Three-State
CD54HC245/3A	8408501RA	CD54HCT245/3A	8550601RA	Octal Bus Transceiver, Three-State
CD54HC251/3A	8512501EA	CD54HCT251/3A	5962-9052401MEA	8-Input MUX, Three-State
CD54HC257/3A	8512401EA	CD54HCT257/3A	5962-8970501EA	Quad 2-Input MUX, Three-State
-	-	CD54HCT258/3A	5962-8970801EA	Quad 2-Line-to-4-Line Data Selector
CD54HC259/3A	8551901EA	CD54HCT259/3A	5962-8985201EA	8-Bit Addressable Latch
CD54HC273/3A	8409901RA	CD54HCT273/3A	5962-8772501RA	Octal D-Type Flip-Flop with Reset
CD54HC280/3A	8607701CA	-	-	9-Bit Odd/Even Parity Generator/Checker
CD54HC283/3A	5962-8976501EA	-	-	4-Bit Binary Full Adder with Fast Carry
CD54HC297/3A	5962-8999001EA	-	-	Digital Phase-Locked-Loop
CD54HC299/3A	5962-8780601RA	CD54HCT299/3A	5962-8943601MRA	8-Bit Universal Shift Register, Three-State
CD54HC365/3A	8500101EA	-	-	Hex Buffer/Line Driver, Three-State
CD54HC366/3A	5962-8682801EA	-	-	Hex Buffer/Line Driver, Three-State, Inverting
CD54HC367/3A	8500201EA	CD54HCT367/3A	5962-9070601MEA	Hex Buffer/Line Driver, Three-State
CD54HC368/3A	5962-8681201EA	-	-	Hex Buffer/Line Driver, Three-State, Inverting
CD54HC373/3A	8407201RA	CD54HCT373/3A	5962-8686701RA	Octal Transparent Latch, Three-State
CD54HC374/3A	8407101RA	CD54HCT374/3A	8550701RA	Octal D-Type Flip-Flop, Three-State
CD54HC377/3A	5962-8780701RA	CD54HCT377/3A	5962-8976901RA	Octal D-Type Flip-Flop with Data Enable

HARRIS SMD AND DESC CROSS REFERENCE GUIDE, DIGITAL - LOGIC CD54HC/HCT (Continued)

CMOS LOGIC HARRIS DEVICE	MILITARY REFERENCE	TTL LOGIC HARRIS DEVICE	MILITARY REFERENCE	DESCRIPTION
-	-	CD54HCT390/3A	5962-9098401MEA	Dual Decade Ripple Counter
CD54HC393/3A	8410001CA	CD54HCT393/3A	5962-8989001CA	Dual 4-Bit Binary Ripple Counter
CD54HC533/3A	5962-8681301RA	-	-	Octal Transparent Latch, Three-State, Inverting
CD54HC534/3A	5962-8681401RA	CD54HCT534/3A	5962-8984901RA	Octal D-Type Flip-Flop, Three-State, Inverting
CD54HC563/3A	5962-8606201RA	-	-	Octal Transparent Latch, Three-State, Inverting
CD54HC564/3A	5962-8681501RA	-	-	Octal D-Type Flip-Flop, Three-State, Inverting
CD54HC573/3A	8512801RA	CD54HCT573/3A	5962-8685601RA	Octal Transparent Latch, Three-State
-	-	CD54HCT574/3A	5962-8974201RA	Octal D-Type Flip-Flop, Three-State
CD54HC597/3A	5962-8681701EA	-	-	8-Bit Shift Register with I/P Latch
CD54HC640/3A	5962-8780901RA	CD54HCT640/3A	5962-8974001RA	Octal Bus Transceiver, Three-State Inverting
CD54HC646/3A	5962-8688501JA	-	-	Octal Bus Transceiver/Register, Three-State
CD54HC688/3A	5962-8681801RA	CD54HCT688/3A	5962-8685701RA	8-Bit Magnitude Comparator
CD54HC4002/3A	8404401CA	-	-	Dual 4-Input NOR Gate
CD54HC4015/3A	5962-8995301EA	-	-	Dual 4-Bit Serial-In/Parallel-Out Shift Register
CD54HC4017/3A	8601101EA	CD54HCT4017/3A	5962-9059701MEA	Johnson Decade Counter with 10 Decoded Outputs
CD54HC4020/3A	8500301EA	CD54HCT4020/3A	5962-8945801EA	14-Stage Binary Ripple Counter
CD54HC4024/3A	8601201CA	-	-	7-Stage Binary Ripple Counter
CD54HC4040/3A	8500401EA	CD54HCT4040/3A	5962-8994701MEA	12-Bit Binary Ripple Counter
CD54HC4046A/3A	5962-8960901EA	CD54HCT4046A/3A	5962-8875701EA	Phase-Locked Loop with VCO
CD54HC4049/3A	5962-8681901EA	-	-	Hex Inverting HIGH-to-LOW Level Shifter
CD54HC4050/3A	5962-8682001EA	-	-	Hex HIGH-to-LOW Level Shifter
-	-	CD54HCT4051/3A	5962-9065401MEA	8-Channel Analog MUX/DeMUX
CD54HC4052/3A	5962-8855601EA	CD54HCT4052/3A	5962-9163001MEA	Dual 4-Channel Analog MUX/DeMUX
CD54HC4053/3A	5962-8775401EA	-	-	Triple 2-Channel Analog MUX/DeMUX
CD54HC4059/3A	5962-8944501JA	CD54HCT4059/3A	5962-8862401JA	Programmable Divide by "N" Counter
CD54HC4060/3A	5962-8768001EA	CD54HCT4060/3A	5962-8977101EA	14-Stage Binary Ripple Counter with Oscillator
CD54HC4066/3A	5962-8950701CA	-	-	Quad Bilateral Switch
CD54HC4075/3A	5962-8772201CA	-	-	Triple 3-Input OR Gate
CD54HC4511/3A	5962-8773301EA	-	-	BCD-to-7 Segment Latch/Decoder/Driver
CD54HC4520/3A	5962-8995401EA	-	-	Dual 4-Bit Synchronous Binary Counter
CD54HC4538/3A	5962-8688601EA	-	-	Dual Precision Monostable Multivibrator
CD54HC7266/3A	8404302CA	-	-	Quad Exclusive NOR
-	-	CD54HCT40102/3A	5962-9057401EA	8-Bit Synchronous BCD Down Counter
CD54HC40103/3A	5962-9055301EA	-	-	8-Bit Binary Down Counter
CD54HCU04/3A	8601001CA	-	-	Hex Inverter (Unbuffered)

Ratings and Specifications

STANDARD DC ELECTRICAL SPECIFICATIONS - CD54HC SERIES

Non-standard DC Electrical Specifications are included in individual data sheets.

PARAMETERS		SYMBOL	TEST CONDITIONS V_{IN} (V)	TEST CONDITIONS	TEST CONDITIONS V_{CC} (V)	T_A = +25°C MIN	T_A = +25°C MAX	T_A = -55°C TO +125°C MIN	T_A = -55°C TO +125°C MAX	UNITS
High Level Input Voltage		V_{IH}			2	1.5	-	1.5	-	V
					4.5	3.15 (Note 1)	-	3.15 (Note 1)	-	V
					6	4.2	-	4.2	-	V
Low Level Input Voltage		V_{IL}			2	-	0.5	-	0.5	V
					4.5	-	1.35 (Note 1)	-	1.35 (Note 1)	V
					6	-	1.8	-	1.8	V
High Level Output Voltage	CMOS Loads	V_{OH}	V_{IL} or V_{IH}	I_O = -20µA	2	1.9	-	1.9	-	V
					4.5	4.4 (Note 1)	-	4.4 (Note 1)	-	V
					6	5.9	-	5.9	-	V
	TTL Loads (Table 1)	V_{OH}	V_{IL} or V_{IH}	I_O (mA) STD	I_O (mA) BUS					
				-4	-6	4.5	3.98 (Note 1)	-	3.7 (Note 1)	-	V
				-5.2	-7.8	6	5.48	-	5.2	-	V
Low Level Output Voltage	CMOS Loads	V_{OL}	V_{IL} or V_{IH}	I_O = 20µA		2	-	0.1	-	0.1	V
						4.5	-	0.1 (Note 1)	-	0.1 (Note 1)	V
						6	-	0.1	-	0.1	V
	TTL Loads (Table 1)		V_{IL} or V_{IH}	I_O (mA) STD	I_O (mA) BUS						
				4	6	4.5	-	0.26 (Note 1)	-	0.4 (Note 1)	V
				5.2	7.8	6	-	0.26	-	0.4	V
Input Leakage Current		I_{IN}	V_{CC} or GND			6	-	±0.1 (Note 1)	-	±1.0 (Note 1)	µA
Quiescent Supply Current (Note 2)	SSI	I_{CC}	V_{CC} or GND	I_{OUT} = 0		6	-	2 (Note 1)	-	40 (Note 1)	µA
	FF					6	-	4 (Note 1)	-	80 (Note 1)	µA
	MSI					6	-	8 (Note 1)	-	160 (Note 1)	µA
Three-State Leakage Current (Note 3)		I_{OZ}	V_{IL} or V_{IH}	V_O = V_{CC} or GND		6	-	±0.5 (Note 1)	-	±10 (Note 1)	µA

NOTES:

1. These limits are tested 100%.
2. Listed in individual data sheets.
3. Individual data sheets will indicate where applicable.

STANDARD DC ELECTRICAL SPECIFICATIONS - CD54HCT SERIES

Non-standard DC Electrical Specifications are included in individual data sheets.

PARAMETERS		SYMBOL	TEST CONDITIONS			T_A = +25°C		T_A = -55°C TO +125°C		UNITS
			V_{IN} (V)		V_{CC} (V)	MIN	MAX	MIN	MAX	
High Level Input Voltage		V_{IH}			4.5	2 (Note 1)	-	2 (Note 1)	-	V
					5.5	2	-	2	-	V
Low Level Input Voltage		V_{IL}			4.5	-	0.8 (Note 1)	-	0.8 (Note 1)	V
					5.5	-	0.8	-	0.8	V
High Level Output Voltage	CMOS Loads	V_{OH}	V_{IL} or V_{IH}	I_O = -20µA	4.5	4.4 (Note 1)	-	4.4 (Note 1)	-	V
	TTL Loads (Table 1)		V_{IL} or V_{IH}	I_O (mA) STD: -4 BUS: -6	4.5	3.98 (Note 1)	-	3.7 (Note 1)	-	V
Low Level Output Voltage	CMOS Loads	V_{OL}	V_{IL} or V_{IH}	I_O = 20µA	4.5	-	0.1 (Note 1)	-	0.1 (Note 1)	V
	TTL Loads (Table 1)		V_{IL} or V_{IH}	I_O (mA) STD: 4 BUS: 6	4.5	-	0.26 (Note 1)	-	0.4 (Note 1)	V
Input Leakage Current		I_{IN}	V_{CC} or GND		6	-	±0.1 (Note 1)	-	±1.0 (Note 1)	µA
Quiescent Supply Current (Note 2)	SSI	I_{CC}	V_{CC} or GND	I_{OUT} = 0	6	-	2 (Note 1)	-	40 (Note 1)	µA
	FF				6	-	4 (Note 1)	-	80 (Note 1)	µA
	MSI				6	-	8 (Note 1)	-	160 (Note 1)	µA
Three-State Leakage Current (Note 3)		I_{OZ}	V_{IL} or V_{IH}	V_O = V_{CC} or GND	6	-	±0.5 (Note 1)	-	±10 (Note 1)	µA

NOTES:

1. These limits are tested 100%.
2. Listed in individual data sheets.
3. Individual data sheets will indicate where applicable.

STANDARD TTL OUTPUT LOAD CHARACTERISTICS - CD54HC/HCT SERIES (Note 1)

PARAMETERS	SYMBOL	TEMP	TEST CONDITIONS					LIMITS		UNITS
			HC/HCT			V_{IN}				
						HC	HCT			
			V_{CC}	V_O	I_O	V_{IL} OR V_{IH}	V_{IL} OR V_{IH}	MIN	MAX	
Output High (Source) Current, TTL Load	I_{OH}	+25°C	4.5	3.98	-	0, 4.5	0, 4.5	-4 (Note 2)	-	mA
		-55°C	4.5	3.70	-	0, 4.5	0, 4.5	-4 (Note 2)	-	mA
		+125°C	4.5	3.70	-	0, 4.5	0, 4.5	-4 (Note 2)	-	mA
Output Low (Sink) Current, TTL Load	I_{OL}	+25°C	4.5	0.26	-	0, 4.5	0, 4.5	4 (Note 2)	-	mA
		-55°C	4.5	0.40	-	0, 4.5	0, 4.5	4 (Note 2)	-	mA
		+125°C	4.5	0.40	-	0, 4.5	0, 4.5	4 (Note 2)	-	mA
High Level Output Voltage, TTL Load	V_{OH}	+25°C	4.5	-	-4	1.35, 3.15	0.8, 2.0	3.98 (Note 2)	-	V
		-55°C	4.5	-	-4	1.35, 3.15	0.8, 2.0	3.70 (Note 2)	-	V
		+125°C	4.5	-	-4	1.35, 3.15	0.8, 2.0	3.70 (Note 2)	-	V
Low Level Output Voltage, TTL Load	V_{OL}	+25°C	4.5	-	4	1.35, 3.15	0.8, 2.0	-	0.26 (Note 2)	V
		-55°C	4.5	-	4	1.35, 3.15	0.8, 2.0	-	0.40 (Note 2)	V
		+125°C	4.5	-	4	1.35, 3.15	0.8, 2.0	-	0.40 (Note 2)	V

NOTES:

1. Individual data sheets will indicate the non-standard bus-driver types which will display different TTL output load characteristics.
2. These limits are tested 100%.

Hi-Rel Advanced CMOS Logic ICs - AC/ACT Series Selection Guide

ADVANCED CMOS LOGIC ICS - AC/ACT SERIES SELECTION GUIDE

CMOS COMPATIBLE LOGIC	TTL COMPATIBLE LOGIC	DESCRIPTION	NUMBER OF LEADS	CLASSIFICATION	ANSWERFAX DOCUMENT NUMBER
CERDIP	CERDIP				
CD54AC00/3A	CD54ACT00/3A	Quad 2-Input NAND Gate	14	SSI	3876
CD54AC02/3A	CD54ACT02/3A	Quad 2-Input NOR Gate	14	SSI	3877
CD54AC04/3A	CD54ACT04/3A	Hex Inverter/Buffer	14	SSI	3878
CD54AC05/3A	CD54ACT05/3A	Hex Inverter/Buffer, Open-Drain Outputs	14	SSI	3879
CD54AC08/3A	CD54ACT08/3A	Quad 2-Input AND Gate	14	SSI	3880
-	CD54ACT20/3A	Dual 4-Input NAND Gate	14	SSI	3881
CD54AC32/3A	CD54ACT32/3A	Quad 2-Input OR Gate	14	SSI	3882
CD54AC74/3A	CD54ACT74/3A	Dual D Flip-Flop with Set and Reset	14	FF	3883
-	CD54ACT86/3A	Quad 2-Input Exclusive-OR Gate	14	SSI	3884
CD54AC109/3A	CD54ACT109/3A	Dual J-K Flip-Flop with Set and Reset	16	FF	3885
CD54AC112/3A	CD54ACT112/3A	Dual J-K Flip-Flop with Set and Reset	16	FF	3886
CD54AC138/3A	CD54ACT138/3A	3-to-8-Line Decoder/DeMUX, Inverting	16	MSI	3887
CD54AC139/3A	CD54ACT139/3A	Dual 2-to-4-Line Decoder/ DeMUX	16	MSI	3888
-	CD54ACT151/3A	8-Input MUX	16	MSI	3889
CD54AC153/3A	CD54ACT153/3A	Dual 4-Input MUX	16	MSI	3890
CD54AC157/3A	-	Quad 2-Input MUX	16	MSI	3891
CD54AC161/3A	CD54ACT161/3A	Synchronous 4-Bit Binary Counter, Asynchronous Reset	16	MSI	3892
CD54AC163/3A	CD54ACT163/3A	Synchronous 4-Bit Binary Counter, Synchronous Reset	16	MSI	3893
CD54AC164/3A	CD54ACT164/3A	8-Bit Serial-In Parallel-Out Shift Register	14	MSI	3894
-	CD54ACT174/3A	Hex D-Type Flip-Flop with Reset	16	MSI	3895
CD54AC191/3A	CD54ACT191/3A	Synchronous 4-Bit Binary Up/Down Counter	16	MSI	3896
CD54AC193/3A	CD54ACT193/3A	Synchronous 4-Bit Binary Up/Down Counter	16	MSI	3897
CD54AC240/3A	CD54ACT240/3A	Octal Buffer/Line Driver, Three-State, Inverting	20	MSI	3898

ADVANCED CMOS LOGIC ICS - AC/ACT SERIES SELECTION GUIDE (Continued)

CMOS COMPATIBLE LOGIC	TTL COMPATIBLE LOGIC	DESCRIPTION	NUMBER OF LEADS	CLASSIFICATION	ANSWERFAX DOCUMENT NUMBER
CERDIP	CERDIP				
-	CD54ACT241/3A	Octal-Buffer/Line Driver, Three-State	20	MSI	3899
CD54AC244/3A	CD54ACT244/3A	Octal-Buffer/Line Driver, Three-State	20	MSI	3900
CD54AC245/3A	CD54ACT245/3A	Octal-Bus Transceiver, Three-State	20	MSI	3901
-	CD54ACT253/3A	Dual 4-Input MUX, Three-State	16	MSI	3902
CD54AC257/3A	CD54ACT257/3A	Quad 2-Input MUX, Three-State	16	MSI	3903
CD54AC273/3A	CD54ACT273/3A	Octal D-Type Flip-Flop with Reset	20	MSI	3904
CD54AC280/3A	CD54ACT280/3A	9-Bit Odd/Even Parity Generator/ Checker	14	MSI	3905
CD54AC283/3A	CD54ACT283/3A	4-Bit Full Adder with Fast Carry	16	MSI	3906
CD54AC299/3A	CD54ACT299/3A	8-Bit Universal Shift Register, Three-State	20	MSI	3907
-	CD54ACT323/3A	8-Bit Universal Shift Register, Three-State (with Synchronous Reset)	20	MSI	3908
CD54AC373/3A	CD54ACT373/3A	Octal Transparent Latch, Three-State,	20	MSI	3909
CD54AC374/3A	CD54ACT374/3A	Octal F Flip-Flop, Three-State	20	MSI	3910
-	CD54ACT533/3A	Octal Transparent Latch, Three-State, Inverting	20	MSI	3911
CD54AC534/3A	CD54ACT534/3A	Octal D Flip-Flop, Three-State, Inverting	20	MSI	3912
-	CD54ACT540/3A	Octal Buffer/Line Driver, Three-State, Inverting	20	MSI	3913
CD54AC541/3A	CD54ACT541/3A	Octal Buffer/Line Driver, Three-State	20	MSI	3914
CD54AC573/3A	CD54ACT573/3A	Octal Transparent Latch, Three-State	20	MSI	3915
CD54AC574/3A	CD54ACT574/3A	Octal D-Type Flip-Flop, Three-State	20	MSI	3916
-	CD54ACT623/3A	Octal Bus Transceiver, Three-State, Non-Inverting	20	MSI	3917

STANDARD DC ELECTRICAL SPECIFICATIONS - CD54AC SERIES

Non-standard DC Electrical Specifications are included in the individual data sheets.

PARAMETERS	SYMBOL	TEST CONDITIONS V_I (V)	TEST CONDITIONS I_O (mA)	V_{CC} (V)	T_A = +25°C MIN	T_A = +25°C MAX	T_A = -55°C TO +125°C MIN	T_A = -55°C TO +125°C MAX	UNITS
High Level Input Voltage	V_{IH}			1.5	1.2	-	1.2	-	V
				3	2.1	-	2.1	-	V
				4.5	3.15 (Note 2)	-	3.15 (Note 2)	-	V
				5.5	3.85	-	3.85	-	V
Low Level Input Voltage	V_{IL}			1.5	-	0.3	-	0.3	V
				3	-	0.9	-	0.9	V
				4.5	-	1.35 (Note 2)	-	1.35 (Note 2)	V
				5.5	-	1.65	-	1.65	V
High Level Output Voltage	V_{OH}	V_{IH} or V_{IL} (Notes 3, 4)	-0.05	1.5	1.4	-	1.4	-	V
			-0.05	3	2.9	-	2.9	-	V
			-0.05	4.5	4.4	-	4.4	-	V
			-4	3	2.58	-	2.4	-	V
			-24	4.5	3.94 (Note 2)	-	3.7 (Note 2)	-	V
			-50	5.5	-	-	3.85	-	V
Low Level Output Voltage	V_{OL}	V_{IH} or V_{IL} (Notes 3, 4)	0.05	1.5	-	0.1	-	0.1	V
			0.05	3	-	0.1	-	0.1	V
			0.05	4.5	-	0.1	-	0.1	V
			12	3	-	0.36	-	0.5	V
			24	4.5	-	0.36 (Note 2)	-	0.5 (Note 2)	V
			50	5.5	-	-	-	1.65	V
Input Leakage Current	I_I	V_{CC} or GND		5.5	-	±0.1 (Note 2)	-	±1.0 (Note 2)	µA
Three-State Leakage Current (Note 5)	I_{OZ}	V_{IH} or V_{IL} V_O = V_{CC} or GND		5.5	-	±0.5 (Note 2)	-	±10 (Note 2)	µA
Quiescent Supply Current (Note 6) MSI	I_{CC}	V_{CC} or GND	0	5.5	-	8 (Note 2)	-	160 (Note 2)	µA
SSI/FF			0	5.5	-	4 (Note 2)	-	80 (Note 2)	µA

NOTES:

1. Unless otherwise specified, all voltages are referenced to ground.
2. These limits are tested 100%.
3. Test one output at a time for a 1s maximum duration. Measurement is made by forcing current and measuring voltage to minimize power dissipation.
4. Test verifies a minimum transmission-line-drive capability of 75Ω for 54AC/ACT Series.
5. Individual data sheets will indicate where applicable.
6. Individual data sheets will indicate complexity.

STANDARD DC ELECTRICAL SPECIFICATIONS - CD54ACT SERIES

Non-standard DC electrical specifications are included in the individual data sheets.

PARAMETERS	SYMBOL	TEST CONDITIONS		V_{CC} (V)	T_A = +25°C		T_A = -55°C TO +125°C		UNITS
		V_I (V)	I_O (mA)		MIN	MAX	MIN	MAX	
High Level Input Voltage	V_{IH}			4.5 to 5.5	2 (Note 1)	-	2 (Note 1)	-	V
Low Level Input Voltage	V_{IL}			4.5 to 5.5	-	0.8 (Note 1)	-	0.8 (Note 1)	V
High Level Output Voltage	V_{OH}	V_{IH} or V_{IL} (Note 2 and Note 3)	-0.05	4.5	4.4	-	4.4	-	V
			-24	4.	3.94 (Note 1)	-	3.7 (Note 2)	-	V
			-50	5.5	-	-	3.85	-	V
Low Level Output Voltage	V_{OL}	V_{IL} or V_{IH} (Note 2 and Note 3)	0.05	4.5	-	0.1	-	0.1	V
			24	4.5	-	0.36 (Note 1)	-	0.5 (Note 1)	V
			50	5.5	-	-	-	1.65	V
Input Leakage Current	I_I	V_{CC} or GND		5.5	-	±0.1 (Note 1)	-	±1.0 (Note 1)	µA
Three-State Leakage Current (Note 4)	I_{OZ}	V_{IH} or V_{IL} V_O = V_{CC} or GND		5.5	-	±0.5 (Note 1)	-	±10 (Note 1)	µA
Quiescent Supply Current (Note 5) MSI	I_{CC}	V_{CC} or GND	0	5.5	-	8 (Note 1)	-	160 (Note 1)	µA
SSI/FF				5.5	-	4 (Note 1)	-	80 (Note 1)	µA
Additional Supply Current per Input Pin, TTL Inputs High, 1 Unit Load	ΔI_{CC}	V_{CC} - 2.1		4.5 to 5.5	-	2.4	-	3	mA

NOTES:

1. These limits are tested 100%.
2. Test one output at a time for a 1s maximum duration. Measurement is made by forcing current and measuring voltage to minimize power dissipation.
3. Test verifies a minimum transmission-line-drive capability of 75Ω for CD54AC/ACT Series.
4. Individual data sheet will indicate open-drain types.
5. Individual data sheet will indicate complexity.

Hi-Rel CMOS Logic ICs - CD4000B Series Selection Guide

CMOS LOGIC ICs - CD4000B SERIES SELECTION GUIDE

GENERIC PART NUMBER	TYPE NUMBER	CIRCUIT FUNCTION	PACKAGE DESIGNATOR	STANDARD SCREENING LEVELS	NUMBER OF PINS
4000A	CD4000A	Dual 3-Input NOR Gate Plus Inverter	F	B	14
4000B	CD4000B	Dual 3-Input NOR Gate Plus Inverter	D	3	14
4000UB	CD4000UB	Dual 3-Input NOR Gate Plus Inverter	D	3	14
4001A	CD4001A	Quad 2-Input NOR Gate	F	B	14
			D, K	3	
4001B	CD4001B	Quad 2-Input NOR Gate	F	B	14
			F	3A	
			D, K	3	
4001UB	CD4001UB	Quad 2-Input NOR Gate	F	B	14
			D	3	
4002A	CD4002A	Dual 4-Input NOR Gate	D	3	14
4002B	CD4002B	Dual 4-Input NOR Gate	F	B	14
			F	3A	
			D, K	3	
4002UB	CD4002UB	Dual 4-Input NOR Gate	F	3A	14
			D, K	3	
4006A	CD4006A	18-Stage Static Shift Register	D	3	14
4006B	CD4006B	18-Stage Static Shift Register	F	3A	14
			D	3	
4007A	CD4007A	Dual Complementary Pair Plus Inverter	F	B	14
			D	3	
4007UB	CD4007UB	Dual Complementary Pair Plus Inverter	F	3A	14
			D	3	
4008B	CD4008B	4-Bit Full Adder with Parallel Carry-Out	F	3A	16
			D	3	
4009UB	CD4009UB	Hex Buffer/Converter (Inverting)	F	3A	16
			D, K	3	
4010B	CD4010B	Hex Buffer/Converter (Non-Inverting)	F	3A	16
			D, K	3	
4011A	CD4011A	Quad 2-Input NAND Gate	F	B	14
			D, K	3	
4011B	CD4011B	Quad 2-Input NAND Gate	F	B	14
			F	3A	
			D, K	3	
4011UB	CD4011UB	Quad 2-Input NAND Gate	F	3A	14
			D	3	
4012A	CD4012A	Dual 4-Input NAND Gate	D	3	14
4012B	CD4012B	Dual 4-Input NAND Gate	F	B	14
			F	3A	
			D	3	
4013A	CD4013A	Dual "D" Flip-Flop with Set/Reset Capability	F	B	14

CMOS LOGIC ICs - CD4000B SERIES SELECTION GUIDE (Continued)

GENERIC PART NUMBER	TYPE NUMBER	CIRCUIT FUNCTION	PACKAGE DESIGNATOR	STANDARD SCREENING LEVELS	NUMBER OF PINS
4013B	CD4013B	Dual "D" Flip-Flop with Set/Reset Capability	F	B	14
			F	3A	
			D, K	3	
4014A	CD4014A	8-Stage Static Shift Register	D	3	16
4014B	CD4014B	8-Stage Static Shift Register	F	3A	16
			D	3	
4015A	CD4015A	Dual 4-Stage Static Shift Register	D	3	16
4015B	CD4015B	Dual 4-Stage Static Shift Register	F	3A	16
			D, K	3	
4016A	CD4016A	Quad Bilateral Switch	D	3	14
4016B	CD4016B	Quad Bilateral Switch	F	3A	14
			D, K	3	
4017A	CD4017A	Decade Counter/Divider	F	B	16
			D	3	
4017B	CD4017B	Decade Counter/Divider	F	B	16
			F	3A	
			D	3	
4018A	CD4018A	Presettable Divide-By "N" Counter	D	3	16
4018B	CD4018B	Presettable Divide-By "N" Counter	F	B	16
			F	3A	
			D, K	3	
4019A	CD4019A	Quad AND/OR Select Gate	F	B	16
			D	3	
4019B	CD4019B	Quad AND/OR Select Gate	F	B	16
			F	3A	
			D, K	3	
4020A	CD4020A	14-Stage Binary Ripple Counter	F	B	16
			D, K	3	
4020B	CD4020B	14-Stage Binary Ripple Counter	F	B	16
			F	3A	
			D	3	
4021A	CD4021A	8-Stage Static Shift Register	D, K	3	16
4021B	CD4021B	8-Stage Static Shift Register	F	B	16
			F	3A	
			D, K	3	
4022A	CD4022A	Divide-by-8 Counter/Divider	D	3	16
4022B	CD4022B	Divide-by-8 Counter/Divider	F	3A	16
			D	3	
4023A	CD4023A	Triple 3-Input NAND Gate	F	B	14
			D, K	3	
4023B	CD4023B	Triple 3-Input NAND Gate	F	B	14
			F	3A	
			D, K	3	
4023UB	CD4023UB	Triple 3-Input NAND Gate	D	3	14

CMOS LOGIC ICs - CD4000B SERIES SELECTION GUIDE (Continued)

GENERIC PART NUMBER	TYPE NUMBER	CIRCUIT FUNCTION	PACKAGE DESIGNATOR	STANDARD SCREENING LEVELS	NUMBER OF PINS
4024A	CD4024A	7-Stage Binary Ripple Counter	F	B	14
			D, K	3	
4024B	CD4024B	7-Stage Binary Ripple Counter	F	B	14
			F	3A	
			D, K	3	
4025A	CD4025A	Triple 3-Input NOR Gate	F	B	14
			D	3	
4025B	CD4025B	Triple 3-Input NOR Gate	F	B	14
			F	3A	
			D	3	
4025UB	CD4025UB	Triple 3-Input NOR Gate	D	3	14
4027A	CD4027A	Dual "J-K" Flip-Flop with Set/Reset Capability	F	B	16
			D, K	3	
4027B	CD4027B	Dual "J-K" Flip-Flop with Set/Reset Capability	F	B	16
			F	3A	
			D, K	3	
4028A	CD4028A	BCD-to-Decimal Decoder	D	3	16
4028B	CD4028B	BCD-to-Decimal Decoder	F	3A	16
			D, K	3	
4029A	CD4029A	Presettable Up/Down Counter	D	3	16
4029B	CD4029B	Presettable Up/Down Counter	F	3A	16
			D, K	3	
4030A	CD4030A	Quad Exclusive-OR Gate	D	3	14
4030B	CD4030B	Quad Exclusive-OR Gate	F	B	14
			F	3A	
			D, K	3	
4031A	CD4031A	64-Stage Static Shift Register	D	3	16
4031B	CD4031B	64-Stage Static Shift Register	F	3A	16
			D, K	3	
4033B	CD4033B	Decade Counter/Divider	D	3	16
4034B	CD4034B	8-Stage Static Shift Register	F	3A	24
			D	3	
4035B	CD4035B	4-Stage Parallel-In/Parallel-Out Shift Register	F	3A	24
			D, K	3	
4040A	CD4040A	12-Stage Binary Ripple Counter	D, K	3	16
4040B	CD4040B	12-Stage Binary Ripple Counter	F	3A	16
			D	3	
4041A	CD4041A	Quad True/Complement Butter	D	3	14
4041UB	CD4041UB	Quad True/Complement Buffer	F	3A	14
			D, K	3	
4042A	CD4042A	Quad Clocked "D" Latch	D, K	3	16
4042B	CD4042B	Quad Clocked "D" Latch	F	3A	16
			D, K	3	
4043A	CD4043A	Quad NOR R/S Latch (Three-State Outputs)	D	3	16

CMOS LOGIC ICs - CD4000B SERIES SELECTION GUIDE (Continued)

GENERIC PART NUMBER	TYPE NUMBER	CIRCUIT FUNCTION	PACKAGE DESIGNATOR	STANDARD SCREENING LEVELS	NUMBER OF PINS
4043B	CD4043B	Quad NOR R/S Latch (Three-State Outputs)	F	3A	16
			D	3	
4044A	CD4044A	Quad NAND R/S Latch (Three-State Outputs)	D	3	16
4044B	CD4044B	Quad NAND R/S Latch (Three-State Outputs)	F	3A	16
			D	3	
4046A	CD4046A	Micropower Phase-Locked Loop	D	3	16
4046B	CD4046B	Micropower Phase-Locked Loop	F	3A	16
			D, K	3	
4047B	CD4047B	Monostable/Astable Multivibrator	F	3A	14
			D	3	
4048A	CD4048A	Multifunctional Expandable 8-Input Gate (Three-State Output)	D	3	16
4048B	CD4048B	Multifunctional Expandable 8-Input Gate (Three-State Outputs)	F	3A	16
			D	3	
4049A	CD4049A	Hex Buffer/Converter (Inverting)	F	B	16
			D	3	
4049UB	CD4049UB	Hex Buffer/Converter (Inverting)	F	B	16
			F	3A	
			D, K	3	
4050A	CD4050A	Hex Buffer/Converter (Non-Inverting)	F	B	16
			D	3	
4050B	CD4050B	Hex Buffer/Converter (Non-Inverting)	F	B	16
			F	3A	
			D, K	3	
4051B	CD4051B	8-Channel Analog MUX/DeMUX	F	3A	16
			D, K	3	
4052B	CD4052B	4-Channel Analog MUX/DeMUX	F	3A	16
			D, K	3	
4053B	CD4053B	Analog MUX/DeMUX Triple 2-Channel	F	3A	16
			D	3	
4054B	CD4054B	4-Segment Display Driver	F	3A	16
4056B	CD4056B	BCD-to-7-Segment Decoder/Driver with Strobed-Latch Function	F	3A	16
4059A	CD4059A	Programmable Divide-by-"N" Counter	D	3	24
4060A	CD4060A	14-Stage Binary Ripple Counter/Divider and Oscillator	D	3	16
4060B	CD4060B	14-Stage Binary Ripple Counter/Divider and Oscillator	F	3A	16
			D	3	
4063B	CD4063B	4-Bit Magnitude Comparator	F	3A	16
			D, K	3	
4066B	CD4066B	Quad Bilateral Switch	F	B	14
			F	3A	
			D, K	3	
4067B	CD4067B	16-Channel Analog MUX/DeMUX	F	3A	24
			D	3	

CMOS LOGIC ICs - CD4000B SERIES SELECTION GUIDE (Continued)

GENERIC PART NUMBER	TYPE NUMBER	CIRCUIT FUNCTION	PACKAGE DESIGNATOR	STANDARD SCREENING LEVELS	NUMBER OF PINS
4068B	CD4068B	8-Input NAND/AND Gate	F	3A	14
			D	3	
4069UB	CD4069UB	Hex Inverter	F	B	14
			F	3A	
			D	3	
4070B	CD4070B	Quad Exclusive-OR Gate	F	B	14
			F	3A	
			D	3	
4071B	CD4071B	Quad 2-Input OR Gate	F	B	14
			F	3A	
			D, K	3	
4072B	CD4072B	Dual 4-Input OR Gate	F	3A	14
			D	3	
4073B	CD4073B	Triple 3-Input AND Gate	F	B	14
			F	3A	
			D	3	
4075B	CD4075B	Triple 3-Input OR Gate	F	B	14
			F	3A	
			D, K	3	
4076B	CD4076B	4-Bit "D" Flip-Flop (Three-State Outputs)	F	3A	16
			D	3	
4077B	CD4077B	Quad Exclusive-NOR Gate	F	3A	14
			D	3	
4078B	CD4078B	8-Bit NOT/OR Gate	F	3A	14
			D	3	
4081B	CD4081B	Quad 2-Input AND Gate	F	B	14
			F	3A	
			D, K	3	
4082B	CD4082B	Dual 4-Input AND Gate	F	B	14
			F	3A	
			D	3	
4085B	CD4085B	Dual 2-Wide, 2-Input AND/OR/INVERT (AOI) Gate	F	3A	14
			D	3	
4086B	CD4086B	Expandable 4-Wide, 2-Input AND/OR/INVERT (AOI) Gate	F	3A	14
			D	3	
4089B	CD4089B	Binary Rate Multiplier	F	3A	16
			D	3	
4093B	CD4093B	Quad 2-Input NAND Schmitt Trigger	F	3A	14
			D	3	
4094B	CD4094B	8-Stage Shift-and-Store Bus Register	F	3A	16
			D	3	
4095B	CD4095B	Gated "J-K" Flip-Flop (Non-Inverting)	F	3A	14
			D	3	
4096B	CD4096B	Gated "J-K" Flip-Flop (Inverting and Non-Inverting)	D	3	14

CMOS LOGIC ICs - CD4000B SERIES SELECTION GUIDE (Continued)

GENERIC PART NUMBER	TYPE NUMBER	CIRCUIT FUNCTION	PACKAGE DESIGNATOR	STANDARD SCREENING LEVELS	NUMBER OF PINS
4097B	CD4097B	8-Channel Analog MUX/DeMUX	D	3	24
4098B	CD4098B	Dual Monostable Multivibrator	F	B	16
			F	3A	
			D, K	3	
4099B	CD4099B	8-Bit Addressable Latch	F	B	16
			F	3A	
			D, K	3	
4502B	CD4502B	Strobed Hex Inverter/Buffer	F	B	16
			F	3A	
			D, K	3	
4503B	CD4503B	Hex Buffer (Non-Inverting)	F	3A	16
			D	3	
4504B	CD4504B	Hex Voltage-Level Shifter for TTL-to-CMOS CMOS-to-CMOS Operation	F	3A	16
4508B	CD4508B	Dual 4-Bit Latch	F	3A	24
			D, K	3	
4510B	CD4510B	Presettable 4-Bit BCD Up/Down Counter	F	3A	16
			D	3	
4511B	CD4511B	BCD-to-7-Segment Latch Decoder/Driver	F	3A	16
			D, K	3	
4512B	CD4512B	8-Channel Data Selector (Three-State Output)	F	3A	16
			D	3	
4514B	CD4514B	4-Bit Latch/4-to-16 Line Decoder (Outputs Low)	F	3A	24
			D	3	
4515B	CD4515B	4-Bit Latch/4-to-16 Line Decoder (Outputs Low)	F	3A	24
			D	3	
4516B	CD4516B	Presettable 4-Bit Binary Up/Down Counter	F	3A	16
			D	3	
4517B	CD4517B	Dual 64-Bit Shift Register	F	3A	16
			D	3	
4518B	CD4518B	Dual BCD Up Counter	F	3A	16
			D	3	
4520B	CD4520B	Dual Binary Up Counter	F	3A	16
			D	3	
4527B	CD4527B	BCD Rate Multiplier	D	3	16
4532B	CD4532B	8-Input Priority Encoder	F	3A	16
			D	3	
4536B	CD4536B	Programmable Timer	F	3A	16
			D	3	
4541B	CD4541B	CMOS Programmable Timer	F	3A	14
4555B	CD4555B	Dual 1 of 4 Decoder/DeMUX (Outputs High)	F	3A	16
4556B	CD4556B	Dual Binary to 1 of 4 Decoder/DeMUX (Outputs Low)	F	3A	16
			D	3	
4585B	CD4585B	4-Bit Magnitude Comparator	F	3A	16

CMOS LOGIC ICs - CD4000B SERIES SELECTION GUIDE (Continued)

GENERIC PART NUMBER	TYPE NUMBER	CIRCUIT FUNCTION	PACKAGE DESIGNATOR	STANDARD SCREENING LEVELS	NUMBER OF PINS
4724B	CD4724B	8-Bit Addressable Latch	F	3A	16
14538B	CD14538B	Dual Precision Monostable Multivibrator	F	3A	16
40100B	CD40100B	9-Bit Parity Generator/Checker	D	3	16
40101B	CD40101B	9-Bit Parity Generator/Checker	F	3A	14
			D	3	
40102B	CD40102B	Presettable 2-Decade BCD Down Counter	D	3	16
40103B	CD40103B	Presettable 8-Bit Binary Down Counter	F	3A	16
			D	3	
40104B	CD40104B	4-Bit Bidirectional Universal Shift Register	D	3	16
40105B	CD40105B	4-Bit X 16 Word FiFo Buffer Register	F	3A	16
			D, K	3	
40106B	CD40106B	Hex Schmitt Trigger	F	3A	14
			D, K	3	
40107B	CD40107B	Dual 2-Input NAND Buffer/Driver	F	3A	14
			D	3	
40108B	CD40108B	4 x 4 Multiport Register	D	3	24
40109B	CD40109B	Quad Low-to-High Voltage Interface	F	3A	16
			D, K	3	
40116	CD40116	CMOS High Speed 8-Bit Directional CMOS/TTL Interface Level Converter (GP511 is Rad Hard Version)	D	3	22
40160B	CD40160B	Synchronous Programmable 4-Bit Counter Decade with Asynchronous Clear	F	3A	16
40161B	CD40161B	Synchronous Programmable 4-Bit Counter Binary with Asynchronous Clear	F	3A	16
			D	3	
40163B	CD40163B	Synchronous Programmable 4-Bit Counter Binary with Synchronous Clear	F	3A	16
40174B	CD40174B	Hex "D" Type Flip-Flop	F	3A	16
			D	3	
40175B	CD40175B	Quad 'D' Type Flip-Flop	F	3A	16
40192B	CD40192B	CMOS Look-Ahead Carry Generator	F	3A	16
			D	3	
40193B	CD40193B	CMOS Presettable Up/Down Counters (Dual Clock with Reset)	F	3A	16
			D	3	
40194B	CD40194B	4-Bit Bidirectional Universal Shift Register	D, K	3	16
40257B	CD40257B	Quad 2-Line-to-1-Line Data Selector/MUX	F	3A	16
			D	3	

Ratings and Specifications

DC ELECTRICAL SPECIFICATIONS - STANDARD "B" SERIES DEVICES

For all CD4000B Series Standard Output CMOS Devices. Parameters are 100% Tested Unless Otherwise Specified.

PARAMETERS		TEST CONDITIONS			-55°C		+25°C		+125°C		UNITS
		V_O	V_{IN}	V_{DD}	MIN	MAX	MIN	MAX	MIN	MAX	
Functional Test (Notes 1 and 2)		-	-	-	-	-	-	-	-	-	
Quiescent Device Current I_{DD} See Classification Table	SSI Types (Note 3)	-	0, 5	5	-	0.25 (Note 2)	-	0.25 (Note 2)	-	7.5 (Note 2)	µA
		-	0, 10	10	-	0.5 (Note 2)	-	0.5 (Note 2)	-	15 (Note 2)	µA
		-	0, 15	15	-	1 (Note 2)	-	1 (Note 2)	-	30 (Note 2)	µA
		-	0, 20	20	-	5	-	5	-	150	µA
	MSI-1 (Note 3 and Note 4)	-	0, 5	5	-	1 (Note 2)	-	1 (Note 2)	-	30 (Note 2)	µA
		-	0, 10	10	-	2 (Note 2)	-	2 (Note 2)	-	60 (Note 2)	µA
		-	0, 15	15	-	4 (Note 2)	-	4 (Note 2)	-	120 (Note 2)	µA
		-	0, 20	20	-	20	-	20	-	600	µA
	MSI-2 (Note 3)	-	0, 5	5	-	5 (Note 2)	-	5 (Note 2)	-	150 (Note 2)	µA
		-	0, 10	10	-	10 (Note 2)	-	10 (Note 2)	-	300 (Note 2)	µA
		-	0, 15	15	-	20 (Note 2)	-	20 (Note 2)	-	600 (Note 2)	µA
		-	0, 20	20	-	100	-	100	-	3000	µA
Output Low Drive Current, I_{OL} Min		0.4	0, 5	5	0.64 (Note 2)	-	0.51	-	0.36 (Note 2)	-	mA
		0.5	0, 10	10	1.6 (Note 2)	-	1.3	-	0.9 (Note 2)	-	mA
		1.5	0, 15	15	4.2 (Note 2)	-	3.4	-	2.4 (Note 2)	-	mA
Output High Drive Current, I_{OH} Min		4.6	0, 5	5	-0.64	-	-0.51	-	-0.36 (Note 2)	-	mA
		2.5	0, 5	5	-2.0	-	-1.6	-	-1.15 (Note 2)	-	mA
		9.5	0, 10	10	-1.6	-	-1.3	-	-0.9 (Note 2)	-	mA
		13.5	0, 15	15	-4.2	-	-3.4	-	-2.4 (Note 2)	-	mA

DC ELECTRICAL SPECIFICATIONS - STANDARD "B" SERIES DEVICES (Continued)

For all CD4000B Series Standard Output CMOS Devices. Parameters are 100% Tested Unless Otherwise Specified.

PARAMETERS		TEST CONDITIONS			-55°C		+25°C		+125°C		UNITS
		V_O	V_{IN}	V_{DD}	MIN	MAX	MIN	MAX	MIN	MAX	
Output Voltage Low-Level, V_{OL} Max		-	0, 5	5	-	0.05 (Note 2)	-	0.05 (Note 2)	-	0.05 (Note 2)	V
		-	0, 10	10	-	0.05 (Note 2)	-	0.05 (Note 2)	-	0.05 (Note 2)	V
		-	0, 15	15	-	0.05	-	0.05	-	0.05	V
Output Voltage High-Level, V_{OH} Min		-	0, 5	5	4.95 (Note 2)	-	4.95 (Note 2)	-	4.95	-	V
		-	0, 10	10	9.95 (Note 2)	-	9.95 (Note 2)	-	9.95	-	V
		-	0, 15	15	14.95	-	14.95	-	14.95	-	V
Input Low Voltage V_{IL} Max	Buffered (B)	4.5	-	5	-	1.5	-	1.5	-	1.5	V
		9	-	10	-	3 (Note 2)	-	3	-	3	V
		13.5	-	15	-	4	-	4	-	4	V
	Unbuffered (UB)	4.5	-	5	-	1 (Note 2)	-	1	-	1	V
		9	-	10	-	2	-	2	-	2	V
		13.5	-	15		2.5		2.5		2.5	V
Input High Voltage V_{IH} Min	Buffered (B)	0.5, 4.5	-	5	3.5	-	3.5	-	3.5	-	V
		1, 9	-	10	7	-	7	-	7	-	V
		1.5, 13.5	-	15	11	-	11	-	11	-	V
	Unbuffered (UB)	0.5, 4.5	-	5	4	-	4	-	4	-	V
		1, 9	-	10	8	-	8	-	8	-	V
		1.5, 13.5	-	15	12.5	-	12.5	-	12.5	-	V
Input Current, I_{IN} (Note 3)		-	0, 20	20	-	±0.1	-	±0.1	-	±1	µA
Three-State Output Leakage Current, I_{OUT} (Note 3, Note 5)		0, 20	0, 20	20	-	±0.4	-	±0.4	-	±12	µA

NOTES:

1. At +25°C V_{IN} = 0 - 20V, V_{DD} = 20V; +125°C V_{IN} = 0 -18V, V_{DD} = 18V; and at -55°C V_{IN} = 0 - 3V, V_{DD} = 3V.
2. These parameters are controlled via design or process parameters and are not directly tested. These parameters are characterized upon initial design release and upon design changes which would affect these characteristics.
3. At -55°C, test is performed with V_{DD} of 18V.
4. CD4047B - Maximum DC supply voltage V_{DD} is 13V for radiation hardened version of this type when operating with RC network.
5. For applicable devices only.

NON-STANDARD DC ELECTRICAL SPECIFICATIONS "B" SERIES DEVICES

PARAMETERS	TEST CONDITIONS			-55°C	+25°C		+125°C	UNITS
	V_O	V_{IN}	V_{DD}	MIN/ MAX	MIN	MAX	MIN/ MAX	
CD4009UB, CD4010B								
Output Low Drive Current, I_{OL} Min (Note 2)	0.4	0, 5	4.5	3.2	2.6	-	1.8	mA
	0.4	0, 5	5	3.75	3 (Note 1)	-	2.1	mA
	0.5	0, 10	10	10.0	8 (Note 1)	-	5.6	mA
	1.5	0, 15	15	30.0	24 (Note 1)	-	16.0	mA
Output High Drive Current, I_{OH} Min (Note 2)	4.6	0, 5	5	-0.25	-0.2 (Note 1)	-	-0.15	mA
	2.5	0, 5	5	-1.0	-0.8 (Note 1)	-	-0.58	mA
	9.5	0, 10	10	-0.55	-0.45 (Note 1)	-	-0.33	mA
	13.5	0, 15	15	-1.65	-1.5 (Note 1)	-	-1.1	mA
CD4016B								
Control Input Voltage Low, V_{IL} Max (Note 2)	$V_{IS} = V_{SS}$, $V_{OS} = V_{DD}$ $V_{IS} = V_{DD}$, $V_{OS} = V_{SS}$ $\lvert I_{IS} \rvert < 10\mu A$		5	0.9 (Note 1)	-	0.7 (Note 1)	0.4 (Note 1)	V
			10	0.9	-	0.7	0.4	V
			15	0.9 (Note 1)	-	0.7 (Note 1)	0.4 (Note 1)	V
Control Input Voltage High, V_{IH} Min (Note 2)	-		5	3.5 (Note 1)	3.5 (Note 1)	-	3.5 (Note 1)	V
			10	7.0	7.0	-	7.0	V
			15	11.0 (Note 1)	11.0 (Note 1)	-	11.0 (Note 1)	V
On-State Resistance, R_{ON} Max R_L = 10K Returned to $V_{DD} - V_{SS}/2$ (Note 2)	$V_{IS} = V_{DD}$ or V_{SS} V_{IS} = 4.75 or 5.75 $V_{IS} = V_{DD}$ or V_{SS} V_{IS} = 7.25 or 7.75		10	600 (Note 1)	-	660 (Note 1)	960 (Note 1)	Ω
			10	1870 (Note 1)	-	2000 (Note 1)	2600 (Note 1)	Ω
			15	360 (Note 1)	-	400 (Note 1)	600 (Note 1)	Ω
			15	775 (Note 1)	-	850 (Note 1)	1230 (Note 1)	Ω
CD4031B								
Output Low Drive Current, I_{OL} Min Q (Note 2)	0.4	0, 5	5	2.56	2.04 (Note 1)	-	1.44	mA
	0.5	0, 10	10	6.4	5.2 (Note 1)	-	3.6	mA
	1.5	0, 15	15	16.8	13.6 (Note 1)	-	9.6	mA
$\overline{Q}$, Q', C_{LD} (Note 2)	0.4	0, 5	5	0.64	0.51 (Note 1)	-	0.36	mA
	0.5	0, 10	10	1.6	1.3 (Note 1)	-	0.9	mA
	1.5	0, 15	15	4.2	3.4 (Note 1)	-	2.4	mA

NON-STANDARD DC ELECTRICAL SPECIFICATIONS "B" SERIES DEVICES (Continued)

PARAMETERS	TEST CONDITIONS			-55°C	+25°C		+125°C	UNITS
	V_O	V_{IN}	V_{DD}	MIN/ MAX	MIN	MAX	MIN/ MAX	
Output High Drive Current, I_{OH} Min Q, $\overline{Q}$, Q', C_{LD} (Note 2)	4.6	0, 5	5	-0.64	-0.51 (Note 1)	-	-0.36	mA
	2.5	0, 5	5	-2.0	-1.6 (Note 1)	-	-1.15	mA
	9.5	0, 10	10	-1.6	-1.3 (Note 1)	-	-0.9	mA
	13.5	0, 15	15	-4.2	-3.4 (Note 1)	-	-2.4	mA
CD4041UB								
Output Low Drive Current, I_{OL} Min (Note 2)	0.4	0, 5	5	2.1	1.6 (Note 1)	-	1.2	mA
	0.5	0, 10	10	6.25	5 (Note 1)	-	3.5	mA
	1.5	0, 15	15	24	19 (Note 1)	-	13	mA
Output High Drive Current, I_{OH} Min (Note 2)	4.6	0, 5	5	-2.1	-1.6 (Note 1)	-	-1.2	mA
	2.5	0, 5	5	-8.4	-6.4 (Note 1)	-	-4.6	mA
	9.5	0, 10	10	-6.25	-5 (Note 1)	-	-3.5	mA
	13.5	0, 15	15	-24	-19 (Note 1)	-	-13	mA
CD4046B								
Zener Diode Voltage, V_Z (Note 3)	I_Z = 50µA			-	4.45 (Note 1)	6.5 (Note 1)	-	V
Quiescent Leakage, Phase Comparator Pin 14 Open, Pin 5 = V_{DD} (Note 3)	-	0, 5	5	0.2	-	0.2	-	mA
	-	0, 10	10	1.0	-	1.0	-	mA
	-	0, 15	15	1.5	-	1.5	-	mA
	-	0, 20	20	4.0 (Note 1)	-	4.0 (Note 1)	-	mA
Quiescent Leakage, Phase Comparator Pin 14 = V_{SS} or V_{DD}, Pin 5 = V_{DD} (Note 3)	-	0, 5	5	20	-	20	-	µA
	-	0, 10	10	40	-	40	-	µA
	-	0, 15	15	80	-	80	-	µA
	-	0, 20	20	160 (Note 1)	-	160 (Note 1)	-	µA
CD4049UB, CD4050B								
Output Low Drive Current, I_{OL} Min (Note 2)	0.4	0, 5	4.5	3.3	2.6 (Note 1)	-	1.8	mA
	0.4	0, 5	5	4.0	3.2 (Note 1)	-	2.4	mA
	0.5	0, 10	10	10	8.0 (Note 1)	-	5.6	mA
	1.5	0, 15	15	26	24 (Note 1)	-	18	mA

NON-STANDARD DC ELECTRICAL SPECIFICATIONS "B" SERIES DEVICES (Continued)

PARAMETERS	TEST CONDITIONS			-55°C	+25°C		+125°C	UNITS
	V_O	V_{IN}	V_{DD}	MIN/ MAX	MIN	MAX	MIN/ MAX	
Output High Drive Current, I_{OH} Min (Note 2)	4.6	0, 5	5	-0.81	-0.8 (Note 1)	-	-0.48	mA
	2.5	0, 5	5	-2.6	-3.2 (Note 1)	-	-1.55	mA
	9.5	0, 10	10	-2.0	-1.8 (Note 1)	-	-1.18	mA
	13.5	0, 15	15	-5.2	-6.0 (Note 1)	-	-3.1	mA
CD4051B, CD4052B, CD4053B, CD4067B, CD4097B								
ON-State Resistance, R_{ON} Max (Note 3)	R_L = 10K Returned to V_{DD} - V_{SS}/2 V_{IS} = V_{SS} to V_{DD}		5	800 (Note 1)	-	1050 (Note 1)	1300 (Note 1)	Ω
			10	310 (Note 1)	-	400 (Note 1)	500 (Note 1)	Ω
			15	200 (Note 1)	-	240 (Note 1)	320 (Note 1)	Ω
Input Voltage Low, V_{IL} Max (Note 2)	V_{EE} = V_{SS} R_L = 1K to V_{SS} $\|I_{IS}\|$ <2μA		5	1.5 (Note 1)	-	1.5 (Note 1)	1.5 (Note 1)	V
			10	3.0	-	3.0	3.0	V
			15	4.0 (Note 1)	-	4.0 (Note 1)	4.0 (Note 1)	V
Input Voltage High, V_{IH} Min (Note 2)	V_{EE} = V_{SS} R_L = 1K to V_{SS} $\|I_{IS}\|$ <2μA		5	3.5 (Note 1)	3.5 (Note 1)	-	3.5 (Note 1)	V
			10	7.0	7.0	-	7.0	V
			15	11.0 (Note 1)	11.0 (Note 1)	-	11.0 (Note 1)	V
Off Channel Leakage Current Any Channel Off Max (Note 3)	V_{SS} = 0	V_{EE} = 0	18	±100 (Note 1)	-	±100 (Note 1)	±1000 (Note 1)	nA
Off Channel Leakage Current All Channels (Common Out/In) Off Max (Note 3)	V_{SS} = 0	V_{EE} = 0	18	±100 (Note 1)	-	±100 (Note 1)	±1000 (Note 1)	nA
CD4054B, CD4056B								
	V_{EE}	V_{SS}						
Output Low (Sink) Current, I_{OL} (Note 2)	-5	0	-4.5	-	5	0.98	0.8 (Note 1)	-	0.55	mA
	0	0	0.5	-	10	0.98	0.8 (Note 1)	-	0.55	mA
	0	0	1.5	-	15	3.6	2.9 (Note 1)	-	2	mA
Output High (Source) Current, I_{OH} (Note 2)	-5	0	4.5	-	5	-0.6	-0.45 (Note 1)	-	-0.3	mA
	0	0	9.5	-	10	-0.6	-0.45 (Note 1)	-	-0.3	mA
	0	0	13.5	-	15	-1.9	-1.5 (Note 1)	-	-1.1	mA

NON-STANDARD DC ELECTRICAL SPECIFICATIONS "B" SERIES DEVICES (Continued)

PARAMETERS	TEST CONDITIONS			-55°C	+25°C		+125°C	UNITS
	V_O	V_{IN}	V_{DD}	MIN/ MAX	MIN	MAX	MIN/ MAX	
CD4066B								
On-State Resistance, R_{ON} Max (Note 3)	R_L = 10K Returned to V_{DD} - V_{SS}/2 V_{IS} = V_{SS} to V_{DD}		5	800 (Note 1)	-	1050 (Note 1)	1300 (Note 1)	Ω
			10	310 (Note 1)	-	400 (Note 1)	550 (Note 1)	Ω
			15	200 (Note 1)	-	240 (Note 1)	320 (Note 1)	Ω
Control Input Voltage Low, V_{ILC} Max (Note 2)	V_{IS} = V_{SS}, V_{OS} = V_{DD}, V_{IS} = V_{DD}, V_{OS} = V_{SS} $\|I_{IS}\|$ <10μA		5	1.0 (Note 1)	-	1.0 (Note 1)	1.0 (Note 1)	V
			10	2.0	-	2.0	2.0	V
			15	2.0 (Note 1)	-	2.0 (Note 1)	2.0 (Note 1)	V
Control Input Voltage High, V_{IHC} Min (Note 2)	-		5	3.5 (Note 1)	3.5 (Note 1)	-	3.5 (Note 1)	V
			10	7.0	7.0	-	7.0	V
			15	11.0 (Note 1)	11.0 (Note 1)	-	11.0 (Note 1)	V
Input/Output Leakage Current (Switch Off) Effective Off Resistance V_C = V_{SS} (Note 3)	0	0	18	±100	-	±100	±1000	nA
CD4093B								
Positive Trigger Threshold Voltage (Note 3) V_P Min	-	(Note 4)	5	2.2 (Note 1)	2.2 (Note 1)	-	2.2 (Note 1)	V
	-	(Note 4)	10	4.6	4.6	-	4.6	V
	-	(Note 4)	15	6.8 (Note 1)	6.8 (Note 1)	-	6.8 (Note 1)	V
	-	(Note 5)	5	2.6 (Note 1)	2.6 (Note 1)	-	2.6 (Note 1)	V
	-	(Note 5)	10	5.6	5.6	-	5.6	V
	-	(Note 5)	15	6.3	6.3	-	6.3	V
V_P Max	-	(Note 4)	5	3.6 (Note 1)	-	3.6 (Note 1)	3.6 (Note 1)	V
	-	(Note 4)	10	7.1	-	7.1	7.1	V
	-	(Note 4)	15	10.8 (Note 1)	-	10.8 (Note 1)	10.8 (Note 1)	V
	-	(Note 5)	5	4 (Note 1)	-	4 (Note 1)	4 (Note 1)	V
	-	(Note 5)	10	8.2	-	8.2	8.2	V
	-	(Note 5)	15	12.7	-	12.7	12.7	V

NON-STANDARD DC ELECTRICAL SPECIFICATIONS "B" SERIES DEVICES (Continued)

PARAMETERS		TEST CONDITIONS			-55°C	+25°C		+125°C	UNITS
		V_O	V_{IN}	V_{DD}	MIN/ MAX	MIN	MAX	MIN/ MAX	
Negative Trigger Threshold Voltage (Note 3)	V_N Min	-	(Note 4)	5	0.9 (Note 1)	0.9 (Note 1)	-	0.9 (Note 1)	V
		-	(Note 4)	10	2.5	2.5	-	2.5	V
		-	(Note 4)	15	4 (Note 1)	4 (Note 1)	-	4 (Note 1)	V
		-	(Note 5)	5	1.4 (Note 1)	1.4 (Note 1)	-	1.4 (Note 1)	V
		-	(Note 5)	10	3.4	3.4	-	3.4	V
		-	(Note 5)	15	4.8	4.8	-	4.8	V
	V_N Max	-	(Note 4)	5	2.8 (Note 1)	-	2.8 (Note 1)	2.8 (Note 1)	V
		-	(Note 4)	10	5.2	-	5.2	5.2	V
		-	(Note 4)	15	7.4 (Note 1)	-	7.4 (Note 1)	7.4 (Note 1)	V
		-	(Note 5)	5	3.2 (Note 1)	-	3.2 (Note 1)	3.2 (Note 1)	V
		-	(Note 5)	10	6.6	-	6.6	6.6	V
		-	(Note 5)	15	9.6	-	9.6	9.6	V
Hysteresis Voltage (Note 3)	V_H Min	-	(Note 4)	5	0.3 (Note 1)	0.3 (Note 1)	-	0.3 (Note 1)	V
		-	(Note 4)	10	1.2	1.2	-	1.2	V
		-	(Note 4)	15	1.6 (Note 1)	1.6 (Note 1)	-	1.6 (Note 1)	V
		-	(Note 5)	5	0.3 (Note 1)	0.3 (Note 1)	-	0.3 (Note 1)	V
		-	(Note 5)	10	1.2	1.2	-	1.2	V
		-	(Note 5)	15	1.6	1.6	-	1.6	V
	V_H Max	-	(Note 4)	5	1.6 (Note 1)	-	1.6 (Note 1)	1.6 (Note 1)	V
		-	(Note 4)	10	3.4	-	3.4	3.4	V
		-	(Note 4)	15	5 (Note 1)	-	5 (Note 1)	5 (Note 1)	V
		-	(Note 5)	5	1.6 (Note 1)	-	1.6 (Note 1)	1.6 (Note 1)	V
		-	(Note 5)	10	3.4	-	3.4	3.4	V
		-	(Note 5)	15	5	-	5	5	V
CD4502B									
Output Low Drive Current, I_{OL} Min (Note 2)		0.4	0, 5	5	3.84	3.06 (Note 1)	-	2.16	mA
		0.5	0, 10	10	9.6	7.8 (Note 1)	-	5.4	mA
		1.5	0, 15	15	25.2	20.4 (Note 1)	-	14.4	mA

NON-STANDARD DC ELECTRICAL SPECIFICATIONS "B" SERIES DEVICES (Continued)

PARAMETERS			TEST CONDITIONS V_O	TEST CONDITIONS V_{IN}	TEST CONDITIONS V_{DD}	-55°C MIN/MAX	+25°C MIN	+25°C MAX	+125°C MIN/MAX	UNITS
CD4503B										
Output Low Drive Current, I_{OL} Min (Note 2)			0.4	0	5	2.6	2.1 (Note 1)	-	1.3	mA
			0.5	0	10	6.5	5.5 (Note 1)	-	3.8	mA
			1.5	0	15	19.2	16.1 (Note 1)	-	11.2	mA
Output High Drive Current, I_{OH} Min (Note 2)			4.6	5	5	-1.2	-1.02 (Note 1)	-	-0.7	mA
			2.5	5	5	-5.8	-4.8 (Note 1)	-	-3.0	mA
			9.5	10	10	-3.1	-2.6 (Note 1)	-	-1.8	mA
			13.5	15	15	-8.2	-6.8 (Note 1)	-	-4.8	mA
CD4504B										
		V_{CC}								
Input Low Voltage V_{IL} Max (Note 2)	TTL-CMOS	5	1	-	10	0.8	-	0.8	0.8	V
	TTL-CMOS	5	1	-	15	0.8 (Note 1)	-	0.8 (Note 1)	0.8 (Note 1)	V
	CMOS-CMOS	5	1	-	10	1.5 (Note 1)	-	1.5 (Note 1)	1.5 (Note 1)	V
	CMOS-CMOS	5	1.5	-	15	1.5	-	1.5	1.5	V
	CMOS-CMOS	10	1.5		15	3 (Note 1)	-	3 (Note 1)	3 (Note 1)	V
Input High Voltage V_{IH} Min (Note 2)	TTL-CMOS	5	9	-	10	2	2	-	2	V
	TTL-CMOS	5	13.5	-	15	2 (Note 1)	2 (Note 1)	-	2 (Note 1)	V
	CMOS-CMOS	5	9	-	10	3.5 (Note 1)	3.5 (Note 1)	-	3.5 (Note 1)	V
	CMOS-CMOS	5	13.5	-	15	3.5	3.5	-	3.5	V
	CMOS-CMOS	10	13.5		15	7 (Note 1)	7 (Note 1)	-	7 (Note 1)	V
CD4511B										
Output Voltage High-Level, V_{OH} Min (Note 3)			-	0, 5	5	4	4.1	-	4.2	V
			-	0, 10	10	9	9.1	-	9.2	V
			-	0, 15	15	14 (Note 1)	14.1 (Note 1)	-	14.2 (Note 1)	V
		I_{OH} (mA)								
Output Drive Voltage High Level, V_{OH} Min (Note 3)		0	-	-	5	4.0	4.1	-	4.2	V
		5	-	-	5	-	-	-	-	V
		10	-	-	5	3.8	3.9	-	3.9	V
		15	-	-	5	-	-	-	3.5	V
		20	-	-	5	3.55	3.4 (Note 1)	-	-	V
		25	-	-	5	3.4	3.1	-	-	V

NON-STANDARD DC ELECTRICAL SPECIFICATIONS "B" SERIES DEVICES (Continued)

PARAMETERS		TEST CONDITIONS V_O	TEST CONDITIONS V_{IN}	TEST CONDITIONS V_{DD}	-55°C MIN/MAX	+25°C MIN	+25°C MAX	+125°C MIN/MAX	UNITS
Output Drive Voltage High Level, V_{OH} Min (Note 3)	0	-	-	10	9.0	9.1	-	9.2	V
	5	-	-	10	-	-	-	-	V
	10	-	-	10	8.85	9.0	-	9.0	V
	15	-	-	10	-	-	-	-	V
	20	-	-	10	8.7	8.6 (Note 1)	-	8.4	V
	25	-	-	10	8.6	8.3	-	-	V
Output Drive Voltage High Level, V_{OH} Min (Note 3)	0	-	-	15	14.0	14.10	-	14.20	V
	5	-	-	15	-	-	-	-	V
	10	-	-	15	13.90	14.0	-	14.0	V
	15	-	-	15	-	-	-	-	V
	20	-	-	15	13.75	13.70 (Note 1)	-	13.50	V
	25	-	-	15	13.65	13.50	-	-	V
CD4541B									
Output Low Drive Current, I_{OL} Min (Note 2)		0.4	0, 5	5	1.9	1.55 (Note 1)	-	1.08	mA
		0.5	0, 10	10	5.0	4.0 (Note 1)	-	2.8	mA
		1.5	0, 15	15	12.6	10.0 (Note 1)	-	7.2	mA
Output High Drive Current, I_{OH} Min (Note 2)		4.6	0, 5	5	-1.9	-1.55 (Note 1)	-	-1.08	mA
		2.5	0, 5	5	-6.2	-5.0 (Note 1)	-	-3.0	mA
		9.5	0, 10	10	-5.0	-4.0 (Note 1)	-	2.8	mA
		13.5	0, 15	15	-12.6	-10.0 (Note 1)	-	-7.2	mA
CD40106B									
Positive Trigger Threshold Voltage (Note 3)	V_P Min	-	-	5	2.2 (Note 1)	2.2 (Note 1)	-	2.2 (Note 1)	V
		-	-	10	4.6 (Note 1)	4.6 (Note 1)	-	4.6 (Note 1)	V
		-	-	15	6.8 (Note 1)	6.8 (Note 1)	-	6.8 (Note 1)	V
	V_P Max	-	-	5	3.6 (Note 1)	-	3.6 (Note 1)	3.6 (Note 1)	V
		-	-	10	7.1 (Note 1)	-	7.1 (Note 1)	7.1 (Note 1)	V
		-	-	15	10.8 (Note 1)	-	10.8 (Note 1)	10.8 (Note 1)	V

NON-STANDARD DC ELECTRICAL SPECIFICATIONS "B" SERIES DEVICES (Continued)

PARAMETERS		TEST CONDITIONS V_O	TEST CONDITIONS V_{IN}	TEST CONDITIONS V_{DD}	-55°C MIN/MAX	+25°C MIN	+25°C MAX	+125°C MIN/MAX	UNITS
Negative Trigger Threshold Voltage (Note 3)	V_N Min	-	-	5	0.9 (Note 1)	0.9 (Note 1)	-	0.9 (Note 1)	V
		-	-	10	2.5 (Note 1)	2.5 (Note 1)	-	2.5 (Note 1)	V
		-	-	15	4 (Note 1)	4 (Note 1)	-	4 (Note 1)	V
	V_N Max	-	-	5	2.8 (Note 1)	-	2.8 (Note 1)	2.8 (Note 1)	V
		-	-	10	5.2 (Note 1)	-	5.2 (Note 1)	5.2 (Note 1)	V
		-	-	15	7.4 (Note 1)	-	7.4 (Note 1)	7.4 (Note 1)	V
Hysteresis Voltage (Note 3)	V_H Min	-	-	5	0.3 (Note 1)	0.3 (Note 1)	-	0.3 (Note 1)	V
		-	-	10	1.2 (Note 1)	1.2 (Note 1)	-	1.2 (Note 1)	V
		-	-	15	1.6 (Note 1)	1.6 (Note 1)	-	1.6 (Note 1)	V
	V_H Max	-	-	5	1.6 (Note 1)	-	1.6 (Note 1)	1.6 (Note 1)	V
		-	-	10	3.4 (Note 1)	-	3.4 (Note 1)	3.4 (Note 1)	V
		-	-	15	5 (Note 1)	-	5 (Note 1)	5 (Note 1)	V
CD40107B									
Output Low Current, I_{OL} Min (Note 2)		0.4	0, 5	5	21	16 (Note 1)	-	12	mA
		1	0, 5	5	44	34 (Note 1)	-	25	mA
		0.5	0, 10	10	49	37 (Note 1)	-	28	mA
		1	0, 10	10	89	68 (Note 1)	-	51	mA
		0.5	0, 15	15	66	50 (Note 1)	-	38	mA
Output High Current, I_{OH} Min (Note 2)		No Internal Pull-Up Device							
Input Low Voltage, V_{IL} Max (Note 2 and Note 6)		4.5	-	5	1.5 (Note 1)	-	1.5 (Note 1)	1.5 (Note 1)	V
		9	-	10	3.0	-	3.0	3.0	V
		13.5	-	15	4.0 (Note 1)	-	4.0 (Note 1)	4.0 (Note 1)	V
Input High Voltage, V_{IH} Max (Notes 2 and 6)		0.5, 4.5	-	5	3.5 (Note 1)	3.5 (Note 1)	-	3.5 (Note 1)	V
		1, 9	-	10	7.0	7.0	-	7.0	V
		1.5, 13.5	-	15	11 (Note 1)	11 (Note 1)	-	11 (Note 1)	V
CD40109B									
Input Low Voltage, V_{IL} Max (Note 2)		V_O	V_{CC}	V_{DD}					
		1, 9	5	10	1.5 (Note 1)	-	1.5 (Note 1)	1.5 (Note 1)	V
		1.5, 13.5	10	15	3 (Note 1)	-	3 (Note 1)	3 (Note 1)	V

NON-STANDARD DC ELECTRICAL SPECIFICATIONS "B" SERIES DEVICES (Continued)

PARAMETERS		TEST CONDITIONS V_O	V_{IN}	V_{DD}	-55°C MIN/MAX	+25°C MIN	+25°C MAX	+125°C MIN/MAX	UNITS
Input High Voltage, V_{IH} Max (Note 2)		1, 9	5	10	3.5 (Note 1)	3.5 (Note 1)	-	3.5 (Note 1)	V
		1.5, 13.5	10	15	7 (Note 1)	7 (Note 1)	-	7 (Note 1)	V
CD40116									
Quiescent Current (Note 3) From V_{DD} Supply I_{DD} Max		Enable = 1 Enable = 0			6.5 (Note 1)	-	5 (Note 1)	5 (Note 1)	mA
From V_{CC} Supply I_{CC} Max					6.5 (Note 1)	-	5 (Note 1)	5 (Note 1)	mA
					100 (Note 1)	-	100 (Note 1)	200 (Note 1)	µA
DATA FLOW - CMOS INPUTS TO TTL OUTPUTS									
Input Current, I_{IN} (Note 2)		V_{IN} = 0, 12V			±60 (Note 1)	-	±60 (Note 1)	±60 (Note 1)	µA
Output Current (Note 2)	I_{OH} Min	V_{OH} = 3V, V_{IL} = 2V			-7.5 (Note 1)	-6 (Note 1)	-	-4.2 (Note 1)	mA
	I_{OL} Min	V_{OL} = 0.4V, V_{IH} = 10V			7.5 (Note 1)	6 (Note 1)	-	4.2 (Note 1)	mA
TTL Three-State Leakage Current, I_{OUT} Max (Note 2)		Enable = 0			±100 (Note 1)	-	±100 (Note 1)	±100 (Note 1)	µA
DATA FLOW - TTL INPUTS TO CMOS OUTPUTS									
Input Current (Note 2)	I_{IL} Max	Any TTL Input V_{IL} = 0 to 0.7V V_{IH} = 2.3V			-600 (Note 1)	-	-500 (Note 1)	-500 (Note 1)	µA
	I_{IH} Max				-450 (Note 1)	-	-350 (Note 1)	-350 (Note 1)	µA
Output Current (Note 2)	I_{OH} Min	V_{OH} = 11.5V, V_{IL} = 0.7V			-4.3 (Note 1)	-3.5 (Note 1)	-	-2.5 (Note 1)	mA
	I_{OL} Min	V_{OL} = 0.5V, V_{IH} = 2.3V			4.3 (Note 1)	3.5 (Note 1)	-	2.5 (Note 1)	mA
CMOS Three-State Output Leakage Current (Notes 2, 8)		V_O = 0, 12V, V_{IN} = 0, 5V			±60	-	±60	±60	µA
ENABLE AND DISABLE INPUTS									
Input Current (Note 2)	I_{IL}	V_{IL} = 0 to 0.7V			-600 (Note 1)	-	-500 (Note 1)	-500 (Note 1)	µA
	I_{IH}	V_{IH} = 2.3V (TTL)			-450 (Note 1)	-	-350 (Note 1)	-350 (Note 1)	µA
	I_{IH}	V_{IH} = 12V (CMOS)			60	-	60	60	µA

NOTES:

1. These limits are tested 100%.
2. Replaces a STD parameter.
3. An Additive parameter.
4. Input on terminals 1, 5, 8, 12, or 2, 6, 9, 13; other inputs to V_{DD}.
5. Input on terminals 1 and 2, 5 and 6, 8 and 9, or 12 and 13; other inputs to V_{DD}.
6. Measured with external pull-up resistor, R_L = 10kΩ to V_{DD}.
7. At -55°C, test is performed with V_{DD} of 18V.
8. CMOS Three-State output leakage test is functionally identical to CMOS-to-TTL input current tests.

SWITCHING CHARACTERISTICS at +25°C, V_{DD} = 5V, C_L = 50pF

TYPE	(NOTE 1) CONDITIONS	PROP DELAY (ns)	TRANS TIME (ns)	MAX CLK INPUT FREQ (MHz)
CD4000B	-	250	200	-
CD4000UB	-	120	200	-
CD4001B	-	250	200	-
CD4001UB	-	120	200	-
CD4002B	-	250	200	-
CD4002UB	-	120	200	-
CD4006B	-	400	200	2.5
CD4007UB	-	110	200	-
CD4008B	Sum In to Sum Out	800	200	-
	Carry In to Sum Out	740	-	-
	Sum In to Carry Out	400	-	-
	Carry In to Carry Out	200	-	-
CD4009UB	-	140 (Note 1)	350 (Note 1)	-
	-	60 (Note 2)	70 (Note 2)	-
CD4010B	-	200 (Note 1)	350 (Note 1)	-
	-	130 (Note 2)	70 (Note 2)	-
CD4011B	-	250	200	-
CD4011UB	-	120	200	-
CD4012B	-	250	200	-
CD4013B	Clock to Q or $\overline{Q}$	300	200	3.5
	Set to Q or Reset to $\overline{Q}$	300 (Note 1)	-	-
	Set to $\overline{Q}$ or Reset to Q	400 (Note 2)	-	-
CD4014B	-	320	200	3
CD4015B	Clock to Q	320	200	3
	Reset to Q	400 (Note 2)	-	-

TYPE	(NOTE 1) CONDITIONS	PROP DELAY (ns)	TRANS TIME (ns)	MAX CLK INPUT FREQ (MHz)
CD4016B	Sig. Input to Sig. Output	100	-	-
	Turn On	70	-	-
CD4017B	Clock to Out	650	200	2.5
	Clock to Carry Out	600	-	-
	Reset to Out	530	-	-
CD4018B	Clock to Q	400	200	3
	Preset/Reset to Q	550	-	-
CD4019B	-	300	200	-
CD4020B	ϕ to Q1	360	200	3.5
	Qn to Qn + 1	330	-	-
	Reset to Q	280 (Note 2)	-	-
CD4021B	-	320	200	3
CD4022B	Clock to Carry Out	600	200	2.5
	Clock to Decode Out	650	-	-
	Reset to Output	530	-	-
CD4023B	-	250	200	-
CD4024B	ϕ to Q1	360	200	3.5
	Qn to Qn +1	330	-	-
	Reset to Q	280 (Note 2)	-	-
CD4025B	-	250	200	-
CD4025UB	-	120	200	-
CD4027B	Clock to Q or $\overline{Q}$	300	200	3.5
	Set to Q or Reset to $\overline{Q}$	300 (Note 1)	-	-
	Set to $\overline{Q}$ or Reset to Q	400 (Note 2)	-	-
CD4028B	-	350	200	-

SWITCHING CHARACTERISTICS at +25°C, V_{DD} = 5V, C_L = 50pF **(Continued)**

TYPE	(NOTE 1) CONDITIONS	PROP DELAY (ns)	TRANS TIME (ns)	MAX CLK INPUT FREQ (MHz)
CD4029B	Q Output	500	200	2
	Carry Output	560	-	-
	Preset Enable to Q	470	-	-
	Preset Enable to Carry Out	640	-	-
	Carry Input to Carry Out	340	-	-
CD4030B	-	280	200	-
CD4031B	Clock to $\overline{Q}$	500	200	2
	Clock to Q	500 (Note 1)	-	-
	Clock to Q	380 (Note 2)	-	-
	Clock to Q'	380	-	-
	$\overline{Clock}$ to C_{LD}	200	-	-
CD4033B	Clock to Carry Out	500	200	2.5
	Clock to Decode Out	700	-	-
	Reset to Carry Out	550 (Note 1)	-	-
	Reset to Decode Out	600	-	-
CD4034B	Parallel In to Parallel Out	700	200	2
	AE to "A" Out t_{PLZ}, t_{PZL}, t_{PHZ}, t_{PZH}	400	-	-
CD4035B	Clock to Q	500	200	2
	Reset to Q	460	-	-
CD4040B	ϕ to Q1	360	200	3.5
	Qn to Qn + 1	330	-	-
	Reset to Q	280 (Note 2)	-	-
CD4041UB	-	120	80	-

TYPE	(NOTE 1) CONDITIONS	PROP DELAY (ns)	TRANS TIME (ns)	MAX CLK INPUT FREQ (MHz)
CD4042B	Data In to Q	220	200	-
	Data In to $\overline{Q}$	300	-	-
	Clock to Q	450	-	-
	Clock to $\overline{Q}$	500	-	-
CD4043B, CD4044B	Set or Reset to Q	300	200	-
	Enable to Q; t_{PHZ}, t_{PZH}	230	-	-
	Enable to Q; t_{PLZ}, t_{PZL}	180	-	-
CD4046B	AC Coupled Signal Input Voltage Sensitivity (Peak to Peak) f_{IN} = 100Hz Sine Wave	360mV Max		
CD4047B	t_R to Q, $\overline{Q}$	1000	200	-
	Astable to Q, $\overline{Q}$	700	-	-
	Retrigger to Q, $\overline{Q}$	600	-	-
	Astable to Oscillator	400	-	-
	Reset to Q, $\overline{Q}$	500	-	-
CD4048B	Ka to Output	600	200	-
CD4049UB	-	120 (Note 1)	160 (Note 1)	-
	-	65 (Note 2)	60 (Note 2)	-
CD4050B	-	140 (Note 1)	160 (Note 1)	-
	-	110 (Note 2)	60 (Note 2)	-
CD4051B	Add to Signal Out	720	-	-
CD4052B, CD4053B	Inhibit to Signal Out - Channel On	720	-	-
	Inhibit to Signal Out - Channel Ott	450	-	-
CD4054B	V_{EE} = -5V	800	200	-
CD4056B	V_{EE} = -5V	1300	200	-

SWITCHING CHARACTERISTICS at +25°C, V_{DD} = 5V, C_L = 50pF **(Continued)**

TYPE	(NOTE 1) CONDITIONS	PROP DELAY (ns)	TRANS TIME (ns)	MAX CLK INPUT FREQ (MHz)
CD4060B	Input Pulse Operation ϕI to Q4	740	200	3.5
	Qn to Qn + 1	200	-	-
	Reset Operation	360 (Note 2)	-	-
CD4063B	Comparator Input to Output	1250	200	-
	Cascade Input to Output	1000	-	-
CD4066B	Signal Input to Signal Output R_L = 200k, $V_C = V_{DD}$, V_{SS} = GND, V_{IS} = Square Wave ≡ 5V and t_R, t_F = 20ns	40	-	-
	t_{PDC}; t_{RC}, t_{FC} = 20ns, R_L = 1K and V_{IS} < 5V	70	-	-
CD4067B	Add or inhibit to Signal Out Channel On	650	-	-
	Signal In to Out	60	-	-
CD4068B	-	300	200	-
CD4069UB	-	110	200	-
CD4070B	-	280	200	-
CD4071B, CD4072B, CD4073B, CD4075B	-	250	200	-
CD4076B	Clock to Q	600	200	-
CD4077B	-	280	200	-
CD4078B	-	300	200	3
CD4081B, CD4082B	-	250	200	-
CD4085B, CD4086B	Data	450 (Note 2)	200	-
		620 (Note 1	-	-
	Inhibit	300 (Note 2)	-	-
		500 (Note 1)	-	-

TYPE	(NOTE 1) CONDITIONS	PROP DELAY (ns)	TRANS TIME (ns)	MAX CLK INPUT FREQ (MHz)
CD4089B	Clock to Out	300	200	1.2
	Clear to Out	760	-	-
	Cascade to Out	180	-	-
CD4093B	-	380	200	-
CD4094B	Clock to Serial Out Qs	600	200	1.25
	Clock to Serial Out Q's	460	-	-
	Clock to Parallel Out	840	-	-
	Strobe to Parallel Out	580	-	-
	Out Enable to Parallel Out, t_{PHZ}, t_{PZH}	280	-	-
	Out Enable to Parallel Out, t_{PLZ}, t_{PZL}	200	-	-
CD4095B, CD4096B	Clock to Output	500	200	3.5
	Set or Reset	300	-	-
CD4097B	Address or Inhibit to Sig Out - Channel On	650	-	-
	Signal In to Out	60	-	-
CD4098B	Trigger to Q, $\overline{Q}$	500	200	-
CD4099B	Data to Output	400	200	-
CD4502B	Data or Inhibit Delay Time	380 (Note 1)	200 (Note 1)	-
		270 (Note 2)	120 (Note 2)	-
	Disable Delay Time, t_{PHZ}	120	-	-
	Disable Delay Time, t_{PZH}	220	-	-
	Disable Delay Time, t_{PLZ}, t_{PZL}	250	-	-
CD4503B	-	150 (Note 1)	90 (Note 1)	-
	-	110 (Note 2)	70 (Note 2)	-
	t_{PHZ}, t_{PZH}	140	-	-
	t_{PLZ}, t_{PZL}	180	-	-

SWITCHING CHARACTERISTICS at +25°C, V_{DD} = 5V, C_L = 50pF **(Continued)**

TYPE	(NOTE 1) CONDITIONS			PROP DELAY (ns)	TRANS TIME (ns)	MAX CLK INPUT FREQ (MHz)
CD4504B	**SHIFT MODE**	V_{CC}	V_{DD}			
	TTL to CMOS $V_{DD} > V_{CC}$	5	10	280 (Note 2)	-	-
	CMOS to CMOS $V_{DD} > V_{CC}$	5	10	240 (Note 2)	-	-
	CMOS to CMOS $V_{CC} > V_{DD}$	10	5	550 (Note 2)	-	-
	TTL to CMOS $V_{DD} > V_{CC}$	5	10	280 (Note 1)	-	-
	CMOS to CMOS $V_{DD} > V_{CC}$	5	10	240 (Note 1)	-	-
	CMOS to CMOS $V_{CC} > V_{DD}$	10	5	400	-	-
	All Modes t_{THL}, t_{TLH}	-	5	200	-	-
		-	10	100	-	-
CD4508B	Strobe In to Data Out			260	200	-
CD4510B	Clock to Q Output			400	200	2
	Preset or Reset to Q			420	-	-
	Clock to Carry Out			480	-	-
	Carry In to Carry Out			250	-	-
	Preset or Reset to Carry Out			640	-	-
CD4511B	Data to Output			1040 (Note 2)	310 (Note 2)	-
	-			1320 (Note 1)	80 (Note 1)	-
CD4512B	Inhibit to Output			280	200	-
	"A" Select to Output			400	-	-
	Data to Output			360	-	-
	t_{PHZ}, t_{PZH}			120	-	-
CD4514B, CD4515B	Strobe or Data			970	200	-
	Inhibit			500	-	-

TYPE	(NOTE 1) CONDITIONS	PROP DELAY (ns)	TRANS TIME (ns)	MAX CLK INPUT FREQ (MHz)
CD4516B	Clock to Q Output	400	200	2
	Preset or Reset to Q	420	-	-
	Clock to Carry Out	480	-	-
	Carry In to Carry Out	250	-	-
	Preset or Reset to Carry Out	640	-	-
CD4517B	Clock to Q16	400	200	3
CD4518B, CD4520B	Clock to Output	560	200	1.5
	Reset to Output	650 (Note 2)	-	-
CD4527B	Clock to Out	300	200	1.2
	Clear to Out	760	-	-
	Cascade to Out	180	-	-
CD4532B	E_I to E_O, E_I to Gs	220	200	-
	Dn to Qm	440	-	-
	Dn to Gs, E_I to Qm	340	-	-
CD4536B	Clock to Q1 8 Bypass High	2000	200	0.5
	Clock to Q1 8 Bypass Low	5000	-	-
	Clock to Q16	8000	-	-
	Reset to Qn	6000 (Note 2)	-	-
CD4541B	Clock to Q(2^8)	10500	200 (Note 2)	0.75
	Clock to Q(2^{16})	18000	360 (Note 1)	-
CD4555B, CD4556B	Select to Any Output	440	200	-
	$\overline{\text{Enable}}$ to Any Output	400	-	-
CD4585B	Comparator Inputs to Outputs	600	200	-
	Cascade Inputs to Outputs	400	-	-

SWITCHING CHARACTERISTICS at +25°C, V_{DD} = 5V, C_L = 50pF **(Continued)**

TYPE	(NOTE 1) CONDITIONS	PROP DELAY (ns)	TRANS TIME (ns)	MAX CLK INPUT FREQ (MHz)
CD4724B	Data to Outputs	400	200	-
	Write Disable to Output	400	-	-
	Reset to Output	350 (Note 2)	-	-
	Address to Output	450	-	-
CD14538B	Trigger to Q, $\overline{Q}$	600	200	-
	Reset to Q or $\overline{Q}$	500	-	-
CD40100B	-	720	200	1
CD40101B	Data In to Output	700	200	-
	Inhibit In to Output	280	-	-
CD40102B, CD40103B	Clock to Output	600	200	0.7
	Carry In/Counter Enable to Output	400	-	-
	Asynchronous Preset Enable to Output	1300 (Note 1)	-	-
	$\overline{Clear}$ to Output	750 (Note 2)	-	-
CD40104B	Clock to Q	440	200	3
	t_{PZH}, t_{PLZ}, t_{PZL}	160	-	-
	t_{PHZ}	90	-	-
CD40105B	Shift Out or Reset to Data Out Ready	370 (Note 2)	200	1.5
	Shift In to Data In Ready	320 (Note 2)	-	-
	Three-State Control to Data Out t_{PZH}	280	-	-
	Ripple Thru Delay Input to Out t_{PLH}	4000 (Note 1)	-	-
CD40106B	-	280	200	-
CD40107B	R_L = 120Ω	200	100	-
CD40108B	Clock or Write Enable to Q	720	200	1.5
	Read or Write Address to Q	600	-	-
	Disable Delay Time, t_{PZH}, t_{PHZ}	200	-	-
	Disable Delay Time, t_{PZL}, t_{PLZ}	260	-	-

TYPE	(NOTE 1) CONDITIONS				PROP DELAY (ns)	TRANS TIME (ns)	MAX CLK INPUT FREQ (MHz)
CD40109B	DATA INPUT TO OUTPUT						
	SHIFT MODE		V_{CC}	V_{DD}			
	L-H		5V	10V	600 (Note 2)	100	-
	L-H		5V	10V	260 (Note 1)	-	-
	H-L		10V	5V	500 (Note 2)	200	-
	H-L		10V	5V	460 (Note 1)	-	-
	THREE-STATE DISABLE DELAY R_L = 1kΩ						
		SHIFT MODE	V_{CC}	V_{DD}			
	t_{PHZ}	L-H	5V	10V	120	-	-
	t_{PHZ}	H-L	10V	5V	400	-	-
	t_{PLZ}	L-H	5V	10V	740	-	-
	t_{PLZ}	H-L	10V	5V	500	-	-
	t_{PZH}	L-H	5V	10V	640	-	-
	t_{PZH}	H-L	10V	5V	600	-	-
	t_{PZL}	L-H	5V	10V	200	-	-
	t_{PZL}	H-L	10V	5V	400	-	-
CD40116	Data In to Data Out, CMOS In, TTL Out				35	40	-
	Data In to Data Out, TTL In, CMOS Out				45	-	-
	Disable to TTL Out, t_{PHZ}, t_{PLZ}				45	-	-
	Disable to TTL Out, t_{PZH}, t_{PZL}				50	-	-
	Enable to CMOS Out, t_{PHZ}, t_{PLZ}				30	-	-
	Enable to CMOS Out, t_{PZH}, t_{PZL}				60	-	-

SWITCHING CHARACTERISTICS AT at +25°C, V_{DD} = 5V, C_L = 50pF **(Continued)**

TYPE	(NOTE 1) CONDITIONS	PROP DELAY (ns)	TRANS TIME (ns)	MAX CLK INPUT FREQ (MHz)
CD40160B, CD40161B, CD40163B	Clock to Q	400	200	2
	Clock to C_{OUT}	450	-	-
	T_E to C_{OUT}	250	-	-
	Clear to Q (CD40160B and CD40161B Only)	500 (Note 2)	-	-
CD40174B	Clock to Output	300	200	3.5
	Clear to Output	200 (Note 2)	-	-
CD40192B, CD40193B	Clock Up or Clock Down to Q, Reset Q	500	200	2
	PE to Q	400	-	-
	Clock Up to Carry, Clock Down to Borrow	320	-	-
	Reset or PE to Borrow or Carry	600	-	-

TYPE	(NOTE 1) CONDITIONS	PROP DELAY (ns)	TRANS TIME (ns)	MAX CLK INPUT FREQ (MHz)
CD40194B	Clock to Q	440	200	3
	Reset to Q	460 (Note 2)	-	-
CD40257B	Data Input to Output	300	200	-
	Select to Output	380	-	-
	Output Disable to Output	-	-	-
	t_{PZH}, t_{PHZ}	190	-	-
	t_{PZL}, t_{PLZ}	190	-	-

NOTES:

1. t_{TLH} or t_{PLH}
2. t_{THL} or t_{PHL}

Logic Package Selection Guide

USING THE SELECTION GUIDE

The first character of each entry indicates the package type, while the number preceding the decimal point details the package lead count. The entire entry indicates the package table containing the appropriate package dimensions (e.g. 14 lead PDIP dimensions are detailed in Table E14.3).

PART NUMBERS	CERDIP	FLATPACK	PDIP	SIDEBRAZE	SOIC	SSOP
CD54HC/HCT00	F14.3					
CD54HC/HCT02	F14.3					
CD54HC/HCT03	F14.3					
CD54HC/HCT04	F14.3					
CD54HC/HCT08	F14.3					
CD54HC/HCT10	F14.3					
CD54HC/HCT11	F14.3					
CD54HC/HCT14	F14.3					
CD54HC/HCT20	F14.3					
CD54HC/HCT27	F14.3					
CD54HC/HCT30	F14.3					
CD54HC/HCT32	F14.3					
CD54HC/HCT73	F14.3					
CD54HC/HCT74	F14.3					
CD54HC/HCT85	F16.3					
CD54HC/HCT86	F14.3					
CD54HC/HCT107	F14.3					
CD54HC/HCT112	F16.3					
CD54HC/HCT123	F16.3					
CD54HC/HCT125	F14.3					
CD54HC/HCT126	F14.3					
CD54HC/HCT132	F14.3					
CD54HC/HCT138	F16.3					
CD54HC/HCT139	F16.3					
CD54HC/HCT147	F16.3					
CD54HC/HCT151	F16.3					
CD54HC/HCT153	F16.3					
CD54HC/HCT154	F24.6					
CD54HC/HCT157	F16.3					
CD54HC/HCT161	F16.3					
CD54HC/HCT163	F16.3					
CD54HC/HCT164	F14.3					
CD54HC/HCT165	F16.3					
CD54HC/HCT166	F16.3					
CD54HC/HCT173	F16.3					
CD54HC/HCT174	F16.3					
CD54HC/HCT175	F16.3					
CD54HC/HCT190	F16.3					
CD54HC/HCT191	F16.3					
CD54HC/HCT193	F16.3					
CD54HC194	F16.3					

EXAMPLE: E 14 .3

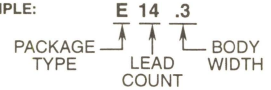
PACKAGE TYPE — LEAD COUNT — BODY WIDTH

Package outlines and dimensions are available in Section 10.

Logic Package Selection Guide

PART NUMBERS	CERDIP	FLATPACK	PDIP	SIDEBRAZE	SOIC	SSOP
CD54HC/HCT221	F16.3					
CD54HC/HCT237	F16.3					
CD54HC/HCT238	F16.3					
CD54HC/HCT240	F20.3					
CD54HCT241	F20.3					
CD54HC/HCT243	F14.3					
CD54HC/HCT244	F20.3					
CD54HC/HCT245	F20.3					
CD54HC/HCT251	F16.3					
CD54HC/HCT257	F16.3					
CD54HC/HCT259	F16.3					
CD54HC/HCT273	F20.3					
CD54HC/HCT280	F14.3					
CD54HC/HCT283	F16.3					
CD54HC/HCT299	F20.3					
CD54HC/HCT366	F16.3					
CD54HC/HCT367	F16.3					
CD54HC/HCT368	F16.3					
CD54HC/HCT373	F20.3					
CD54HC/HCT374	F20.3					
CD54HC/HCT377	F20.3					
CD54HCT390	F16.3					
CD54HC/HCT393	F14.3					
CD54HC/HCT423	F16.3					
CD54HC/HCT540	F20.3					
CD54HC/HCT541	F20.3					
CD54HC/HCT564	F20.3					
CD54HC/HCT573	F20.3					
CD54HC/HCT574	F20.3					
CD54HC/HCT597	F16.3					
CD54HC/HCT646	F24.6					
CD54HC/HCT670	F16.3					
CD54HC/HCT688	F20.3					
CD54HC/HCT4015	F16.3					
CD54HC/HCT4017	F16.3					
CD54HC/HCT4020	F16.3					
CD54HC/HCT4024	F16.3					
CD54HC/HCT4040	F16.3					
CD54HC/HCT4046A	F16.3					
CD54HC/HCT4051	F16.3					
CD54HC/HCT4052	F16.3					
CD54HC/HCT4053	F16.3					
CD54HC/HCT4060	F16.3					
CD54HC/HCT4066	F14.3					
CD54HCT4067	F24.6					
CD54HC/HCT4094	F16.3					
CD54HC/HCT4511	F16.3					

EXAMPLE: E 14 .3



Package outlines and dimensions are available in Section 10.

Logic Package Selection Guide

PART NUMBERS	CERDIP	FLATPACK	PDIP	SIDEBRAZE	SOIC	SSOP
CD54HC/HCT4514	F24.6					
CD54HC/HCT4518	F16.3					
CD54HC/HCT4520	F16.3					
CD54HC/HCT4538	F16.3					
CD54HC7266	F14.3					
CD54HC/HCT40102	F16.3					
CD54HC/HCT40103	F16.3					
CD54HC/HCT40105	F16.3					
CD74HC/HCT00			E14.3		M14.15	
CD74HC/HCT02			E14.3		M14.15	
CD74HC/HCT03			E14.3		M14.15	
CD74HC/HCT04			E14.3		M14.15	
CD74HC/HCT08			E14.3		M14.15	
CD74HC/HCT10			E14.3		M14.15	
CD74HC/HCT11			E14.3		M14.15	
CD74HC/HCT14			E14.3		M14.15	
CD74HC/HCT20			E14.3		M14.15	
CD74HC/HCT21			E14.3		M14.15	
CD74HC/HCT27			E14.3		M14.15	
CD74HC/HCT30			E14.3		M14.15	
CD74HC/HCT32			E14.3		M14.15	
CD74HC/HCT42			E16.3		M16.15	
CD74HC/HCT73			E14.3		M14.15	
CD74HC/HCT74			E14.3		M14.15	
CD74HC/HCT75			E16.3		M16.15	
CD74HC/HCT85			E16.3		M16.15	
CD74HC/HCT86			E14.3		M14.15	
CD74HC/HCT93			E14.3		M14.15	
CD74HC/HCT107			E14.3		M14.15	
CD74HC/HCT109			E16.3		M16.15	
CD74HC/HCT112			E16.3		M16.15	
CD74HC/HCT123			E16.3		M16.15	
CD74HC/HCT125			E14.3		M14.15	
CD74HC/HCT126			E14.3		M14.15	
CD74HC/HCT132			E14.3		M14.15	
CD74HC/HCT137			E16.3		M16.15	
CD74HC/HCT138			E16.3		M16.15	
CD74HC/HCT139			E16.3		M16.15	
CD74HC/HCT147			E16.3		M16.15	
CD74HC/HCT151			E16.3		M16.15	
CD74HC/HCT153			E16.3		M16.15	
CD74HC/HCT154			E24.3, E24.6		M24.3	
CD74HC/HCT157			E16.3		M16.15	
CD74HC/HCT158			E16.3		M16.15	
CD74HC/HCT160			E16.3		M16.15	
CD74HC/HCT161			E16.3		M16.15	
CD74HC/HCT162			E16.3		M16.15	

EXAMPLE: E 14 .3

- E — PACKAGE TYPE
- 14 — LEAD COUNT
- .3 — BODY WIDTH

Package outlines and dimensions are available in Section 10.

Logic Package Selection Guide

PART NUMBERS	CERDIP	FLATPACK	PDIP	SIDEBRAZE	SOIC	SSOP
CD74HC/HCT163			E16.3		M16.15	
CD74HC/HCT164			E14.3		M14.15	
CD74HC/HCT165			E16.3		M16.15	
CD74HC/HCT166			E16.3		M16.15	
CD74HC/HCT173			E16.3		M16.15	
CD74HC/HCT174			E16.3		M16.15	
CD74HC/HCT175			E16.3		M16.15	
CD74HC/HCT181			E24.3, E24.6			
CD74HC/HCT190			E16.3		M16.15	
CD74HC/HCT191			E16.3		M16.15	
CD74HC/HCT192			E16.3		M16.15	
CD74HC/HCT193			E16.3		M16.15	
CD74HC/HCT194			E16.3		M16.15	
CD74HC/HCT195			E16.3		M16.15	
CD74HC/HCT221			E16.3		M16.15	
CD74HC/HCT237			E16.3		M16.15	
CD74HC/HCT238			E16.3		M16.15	
CD74HC/HCT240			E20.3		M20.3	
CD74HC/HCT241			E20.3		M20.3	
CD74HC/HCT242			E14.3		M14.15	
CD74HC/HCT243			E14.3		M14.15	
CD74HC/HCT244			E20.3		M20.3	
CD74HC/HCT245			E20.3		M20.3	
CD74HC/HCT251			E16.3		M16.15	
CD74HC/HCT253			E16.3		M16.15	
CD74HC/HCT257			E16.3		M16.15	
CD74HC/HCT258			E16.3		M16.15	
CD74HC/HCT259			E16.3		M16.15	
CD74HC/HCT273			E20.3		M20.3	
CD74HC/HCT280			E14.3		M14.15	
CD74HC/HCT283			E16.3		M16.15	
CD74HC/HCT297			E16.3			
CD74HC/HCT299			E20.3		M20.3	
CD74HC/HCT354			E20.3			
CD74HC/HCT356			E20.3			
CD74HC/HCT365			E16.3		M16.15	
CD74HC/HCT366			E16.3		M16.15	
CD74HC/HCT367			E16.3		M16.15	
CD74HC/HCT368			E16.3		M16.15	
CD74HC/HCT373			E20.3		M20.3	
CD74HC/HCT374			E20.3		M20.3	
CD74HC/HCT377			E20.3		M20.3	
CD74HC/HCT390			E16.3		M16.15	
CD74HC/HCT393			E14.3		M14.15	
CD74HC/HCT423			E16.3		M16.15	
CD74HC/HCT533			E20.3			
CD74HC/HCT534			E20.3		M20.3	

EXAMPLE: E 14 .3

Package outlines and dimensions are available in Section 10.

Logic Package Selection Guide

PART NUMBERS	CERDIP	FLATPACK	PDIP	SIDEBRAZE	SOIC	SSOP
CD74HC/HCT540			E20.3		M20.3	
CD74HC/HCT541			E20.3		M20.3	
CD74HC/HCT563			E20.3		M20.3	
CD74HC/HCT564			E20.3		M20.3	
CD74HC/HCT573			E20.3		M20.3	
CD74HC/HCT574			E20.3		M20.3	
CD74HC/HCT583			E16.3			
CD74HC/HCT597			E16.3		M16.15	
CD74HC/HCT640			E20.3		M20.3	
CD74HC/HCT643			E20.3			
CD74HC/HCT646			E24.3, E24.6		M24.3	
CD74HC/HCT648			E24.3		M24.3	
CD74HC/HCT670			E16.3		M16.15	
CD74HC/HCT688			E20.3		M20.3	
CD74HC/HCT4002			E14.3		M14.15	
CD74HC/HCT4015			E16.3		M16.15	
CD74HC/HCT4016			E14.3			
CD74HC/HCT4017			E16.3		M16.15	
CD74HC/HCT4020			E16.3		M16.15	
CD74HC/HCT4024			E16.3		M16.15	
CD74HC/HCT4040			E16.3		M16.15	
CD74HC/HCT4046A			E16.3		M16.15	
CD74HC4049			E16.3		M16.15	
CD74HC4050			E16.3		M16.15	
CD74HC/HCT4051			E16.3		M16.15	
CD74HC/HCT4052			E16.3		M16.15	
CD74HC/HCT4053			E16.3		M16.15	
CD74HC/HCT4059			E24.3, E24.6		M24.3	
CD74HC/HCT4060			E16.3		M16.15	
CD74HC/HCT4066			E14.3		M14.15	
CD74HC/HCT4067			E24.3		M24.3	
CD74HC/HCT4075			E14.3		M14.15	
CD74HC/HCT4094			E16.3		M16.15	
CD74HC/HCT4316			E16.3		M16.15	
CD74HC/HCT4351			E20.3		M20.3	
CD74HC/HCT4352			E20.3		M20.3	
CD74HC/HCT4353			E20.3			
CD74HC/HCT4510					M16.15	
CD74HC/HCT4511			E16.3		M16.15	
CD74HC/HCT4514			E24.3, E24.6		M24.3	
CD74HC/HCT4515			E24.3, E24.6		M24.3	
CD74HC/HCT4516			E16.3		M16.15	
CD74HC/HCT4518			E16.3		M16.15	
CD74HC/HCT4520			E16.3		M16.15	
CD74HC/HCT4538			E16.3		M16.15	
CD74HC/HCT4543			E16.3			
CD74HC/HCT7030			E28.6			

EXAMPLE: E 14 .3

PACKAGE TYPE — LEAD COUNT — BODY WIDTH

Package outlines and dimensions are available in Section 10.

Logic Package Selection Guide

PART NUMBERS	CERDIP	FLATPACK	PDIP	SIDEBRAZE	SOIC	SSOP
CD74HC/HCT7046A			E16.3		M16.15	
CD74HC7266			E14.3		M14.15	
CD74HC/HCT40102			E16.3		M16.15	
CD74HC/HCT40103			E16.3		M16.15	
CD74HC/HCT40104					M16.15	
CD74HC/HCT40105			E16.3		M16.15	
CD74HCU04			E14.3		M14.15	
CD54AC/ACT00/3A	F14.3					
CD54AC/ACT02/3A	F14.3					
CD54AC/ACT04/3A	F14.3					
CD54AC/ACT05/3A	F14.3					
CD54AC/ACT08/3A	F14.3					
CD54ACT20/3A	F14.3					
CD54AC/ACT32/3A	F14.3					
CD54AC/ACT74/3A	F14.3					
CD54ACT86/3A	F14.3					
CD54AC/ACT109/3A	F16.3					
CD54AC/ACT112/3A	F16.3					
CD54AC/ACT138/3A	F16.3					
CD54AC/ACT139/3A	F16.3					
CD54ACT151/3A	F16.3					
CD54AC/ACT153/3A	F16.3					
CD54AC157/3A	F16.3					
CD54AC/ACT161/3A	F16.3					
CD54AC/ACT163/3A	F16.3					
CD54AC/ACT164/3A	F14.3					
CD54ACT174/3A	F16.3					
CD54AC/ACT191/3A	F16.3					
CD54AC/ACT193/3A	F16.3					
CD54AC/ACT240/3A	F20.3					
CD54ACT241/3A	F20.3					
CD54AC/ACT244/3A	F20.3					
CD54AC/ACT245/3A	F20.3					
CD54ACT253/3A	F16.3					
CD54AC/ACT257/3A	F16.3					
CD54AC/ACT273/3A	F20.3					
CD54AC/ACT280/3A	F14.3					
CD54AC/ACT283/3A	F16.3					
CD54AC/ACT299/3A	F20.3					
CD54ACT323/3A	F20.3					
CD54AC/ACT373/3A	F20.3					
CD54AC/ACT374/3A	F20.3					
CD54ACT533/3A	F20.3					
CD54AC/ACT534/3A	F20.3					
CD54ACT540/3A	F20.3					
CD54AC/ACT541/3A	F20.3					
CD54AC/ACT573/3A	F20.3					

EXAMPLE: E 14 .3

Package outlines and dimensions are available in Section 10.

PART NUMBERS	CERDIP	FLATPACK	PDIP	SIDEBRAZE	SOIC	SSOP
CD54AC/ACT574/3A	F20.3					
CD54ACT623/3A	F20.3					
CD74AC/ACT00			E14.3		M14.15	
CD74AC/ACT02			E14.3		M14.15	
CD74AC/ACT04			E14.3		M14.15	
CD74AC/ACT05			E14.3		M14.15	
CD74AC/ACT08			E14.3		M14.15	
CD74AC/ACT10			E14.3		M14.15	
CD74AC/ACT14			E14.3		M14.15	
CD74AC/ACT20			E14.3		M14.15	
CD74AC/ACT32			E14.3		M14.15	
CD74AC/ACT74			E14.3		M14.15	
CD74AC/ACT86			E14.3		M14.15	
CD74AC/ACT109			E16.3		M16.15	
CD74AC/ACT112			E16.3		M16.15	
CD74AC/ACT138			E16.3		M16.15	
CD74AC/ACT139			E16.3		M16.15	
CD74AC/ACT151			E16.3		M16.15	
CD74AC/ACT153			E16.3		M16.15	
CD74AC/ACT157			E16.3		M16.15	
CD74AC/ACT158			E16.3		M16.15	
CD74AC/ACT161			E16.3		M16.15	
CD74AC/ACT163			E16.3		M16.15	
CD74AC/ACT164			E14.3		M14.15	
CD74AC/ACT174			E16.3		M16.15	
CD74AC/ACT175			E16.3		M16.15	
CD74AC/ACT191			E16.3		M16.15	
CD74AC/ACT193			E16.3		M16.15	
CD74AC/ACT238			E16.3		M16.15	
CD74AC/ACT240			E20.3		M20.3	
CD74AC/ACT241			E20.3		M20.3	
CD74AC/ACT244			E20.3		M20.3	M20.209
CD74AC/ACT245			E20.3		M20.3	M20.209
CD74AC/ACT251			E16.3			
CD74AC/ACT253			E16.3		M16.15	
CD74AC/ACT257			E16.3		M16.15	M16.209
CD74AC/ACT258			E16.3		M16.15	
CD74AC/ACT273			E20.3		M20.3	M20.209
CD74AC/ACT280			E14.3		M14.15	
CD74AC/ACT283			E16.3		M16.15	
CD74AC/ACT297					M16.15	
CD74AC/ACT299			E20.3		M20.3	
CD74AC/ACT323			E20.3			
CD74AC/ACT373			E20.3		M20.3	
CD74AC/ACT374			E20.3		M20.3	
CD74AC/ACT533			E20.3		M20.3	
CD74AC/ACT534			E20.3		M20.3	

EXAMPLE: E 14 .3

Package outlines and dimensions are available in Section 10.

Logic Package Selection Guide

PART NUMBERS	CERDIP	FLATPACK	PDIP	SIDEBRAZE	SOIC	SSOP
CD74AC/ACT540			E20.3		M20.3	
CD74AC/ACT541			E20.3		M20.3	M20.209
CD74AC/ACT563			E20.3		M20.3	
CD74AC/ACT564			E20.3		M20.3	
CD74AC/ACT573			E20.3		M20.3	
CD74AC/ACT574			E20.3		M20.3	
CD74AC/ACT623			E20.3		M20.3	
CD74AC/ACT646			E24.3		M24.3	M24.209
CD74AC/ACT647					M24.3	
CD74AC/ACT648			E24.3		M24.3	
CD74AC/ACT651			E24.3		M24.3	
CD74AC/ACT652			E24.3		M24.3	
CD74AC/ACT653					M24.3	
CD74AC/ACT654			E24.3			
CD74AC/ACT7060			E20.3		M20.3	
CD74AC/ACT7623			E20.3		M20.3	
CD74FCT240			E20.3		M20.3	M20.209
CD74FCT241			E20.3		M20.3	
CD74FCT244			E20.3		M20.3	M20.209
CD74FCT245			E20.3		M20.3	M20.209
CD74FCT273			E20.3		M20.3	
CD74FCT373			E20.3		M20.3	
CD74FCT374			E20.3		M20.3	M20.209
CD74FCT533					M20.3	
CD74FCT540			E20.3		M20.3	
CD74FCT541			E20.3		M20.3	M20.209
CD74FCT543			E24.3		M24.3	M24.209
CD74FCT564			E20.3		M20.3	
CD74FCT573			E20.3		M20.3	M20.209
CD74FCT574			E20.3		M20.3	M20.209
CD74FCT623					M20.3	
CD74FCT646			E24.3		M24.3	M24.209
CD74FCT651			E24.3		M24.3	
CD74FCT652			E24.3		M24.3	
CD74FCT653			E24.3		M24.3	
CD74FCT654			E24.3		M24.3	
CD74FCT821A			E24.3		M24.3	
CD74FCT822A			E24.3			
CD74FCT823A			E24.3			
CD74FCT824A			E24.3			
CD74FCT841A			E24.3		M24.3	
CD74FCT842A					M24.3	
CD74FCT843A			E24.3		M24.3	
CD74FCT844A			E24.3			
CD74FCT861A					M24.3	
CD74FCT863A					M24.3	
CD74FCT2952A					M24.3	

EXAMPLE: E 14 .3

PACKAGE TYPE — LEAD COUNT — BODY WIDTH

Package outlines and dimensions are available in Section 10.

PART NUMBERS	CERDIP	FLATPACK	PDIP	SIDEBRAZE	SOIC	SSOP
CD74FCT7623					M20.3	
CD4001B	F14.3	K14.B	E14.3	D14.3		
CD4001UB	F14.3		E14.3	D14.3		
CD4002B	F14.3	K14.B	E14.3	D14.3		
CD4006B	F14.3		E14.3	D14.3		
CD4007UB	F14.3		E14.3	D14.3		
CD4008B	F16.3	K16.D	E16.3	D16.3		
CD4009UB	F16.3	K16.D	E16.3	D16.3		
CD4010B	F16.3	K16.D	E16.3	D16.3		
CD4011B	F14.3	K14.B	E14.3	D14.3		
CD4011UB	F14.3		E14.3	D14.3		
CD4012B	F14.3	K14.B	E14.3	D14.3		
CD4013B	F14.3	K14.B	E14.3	D14.3		
CD4014B	F16.3	K16.D	E16.3	D16.3		
CD4015B	F16.3	K16.D	E16.3	D16.3		
CD4016B	F14.3	K14.B	E14.3	D14.3		
CD4017B	F16.3	K16.D	E16.3	D16.3		
CD4018B	F16.3	K16.D	E16.3	D16.3		
CD4019B	F16.3	K16.D	E16.3	D16.3		
CD4020B	F16.3	K16.D	E16.3	D16.3		
CD4021B	F16.3	K16.D	E16.3	D16.3		
CD4022B	F16.3		E16.3	D16.3		
CD4023B	F14.3	K14.B	E14.3	D14.3		
CD4024B	F14.3	K14.B	E14.3	D14.3		
CD4025B	F14.3		E14.3	D14.3		
CD4026B	F16.3		E16.3			
CD4027B	F16.3	K16.D	E16.3	D16.3		
CD4028B	F16.3	K16.D	E16.3	D16.3		
CD4029B	F16.3	K16.D	E16.3	D16.3		
CD4030B	F14.3	K14.B	E14.3	D14.3		
CD4031B	F16.3	K16.D	E16.3	D16.3		
CD4033B			E16.3	D16.3		
CD4034B	F24.6		E24.6	D24.6		
CD4035B	F16.3	K16.D	E16.3	D16.3		
CD4040B	F16.3	K16.D	E16.3	D16.3		
CD4041UB	F14.3	K14.B	E14.3	D14.3		
CD4042B	F16.3	K16.D	E16.3	D16.3		
CD4043B	F16.3		E16.3	D16.3		
CD4044B	F16.3		E16.3	D16.3		
CD4045B			E16.3			
CD4046B	F16.3	K16.D	E16.3	D16.3		
CD4047B	F14.3		E14.3	D14.3		
CD4048B	F16.3		E16.3	D16.3		
CD4049UB	F16.3	K16.D	E16.3	D16.3		
CD4050B	F16.3	K16.D	E16.3	D16.3		
CD4051B	F16.3	K16.D	E16.3	D16.3		
CD4052B	F16.3	K16.D	E16.3	D16.3		

EXAMPLE: E 14 .3

Package outlines and dimensions are available in Section 10.

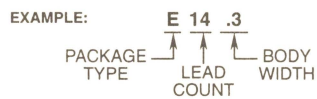
Logic Package Selection Guide

PART NUMBERS	CERDIP	FLATPACK	PDIP	SIDEBRAZE	SOIC	SSOP
CD4053B	F16.3		E16.3	D16.3		
CD4054B	F16.3		E16.3			
CD4055B			E16.3			
CD4056B	F16.3		E16.3			
CD4059A	F24.6		E24.6	D24.6		
CD4060B	F16.3		E16.3	D16.3		
CD4063B	F16.3	K16.D	E16.3	D16.3		
CD4066B	F14.3	K14.B	E14.3	D14.3		
CD4067B	F24.6		E24.6	D24.6		
CD4068B	F14.3		E14.3	D14.3		
CD4069UB	F14.3	K14.B	E14.3	D14.3		
CD4070B	F14.3		E14.3	D14.3		
CD4071B	F14.3	K14.B	E14.3	D14.3		
CD4072B	F14.3		E14.3	D14.3		
CD4073B	F14.3		E14.3	D14.3		
CD4075B	F14.3	K14.B	E14.3	D14.3		
CD4076B	F16.3		E16.3	D16.3		
CD4077B	F14.3		E14.3	D14.3		
CD4078B	F14.3		E14.3	D14.3		
CD4081B	F14.3	K14.B	E14.3	D14.3		
CD4082B	F14.3		E14.3	D14.3		
CD4085B	F14.3		E14.3	D14.3		
CD4086B	F14.3		E14.3	D14.3		
CD4089B	F16.3		E16.3	D16.3		
CD4093B	F14.3	K14.B	E14.3	D14.3		
CD4094B	F16.3		E16.3	D16.3		
CD4095B	F14.3		E14.3	D14.3		
CD4096B	F14.3		E14.3	D14.3		
CD4097B	F24.6		E24.6	D24.6		
CD4098B	F16.3	K16.D	E16.3	D16.3		
CD4099B	F16.3	K16.D	E16.3	D16.3		
CD4502B	F16.3	K16.D	E16.3	D16.3		
CD4503B	F16.3	K16.D	E16.3	D16.3		
CD4504B	F16.3		E16.3	D16.3		
CD4508B	F24.6	K24.D	E24.6	D24.6		
CD4510B	F16.3		E16.3	D16.3		
CD4511B	F16.3	K16.D	E16.3	D16.3		
CD4512B	F16.3		E16.3	D16.3		
CD4514B	F24.6		E24.6	D24.6		
CD4515B	F24.6		E24.6	D24.6		
CD4516B	F16.3	K16.D	E16.3	D16.3		
CD4517B	F16.3		E16.3	D16.3		
CD4518B	F16.3		E16.3	D16.3		
CD4519B	F16.3		E16.3			
CD4520B	F16.3	K16.D	E16.3	D16.3		
CD4521B	F16.3		E16.3			
CD4522B	F16.3		E16.3			

EXAMPLE: E 14 .3

Package outlines and dimensions are available in Section 10.

PART NUMBERS	CERDIP	FLATPACK	PDIP	SIDEBRAZE	SOIC	SSOP
CD4527B	F16.3		E16.3	D16.3		
CD4529B	F16.3		E16.3			
CD4532B	F16.3		E16.3	D16.3		
CD4536B	F16.3		E16.3	D16.3		
CD4541B	F14.3		E14.3			
CD4543B			E16.3			
CD4555B	F16.3	K16.D	E16.3	D16.3		
CD4556B	F16.3		E16.3	D16.3		
CD4560B	F16.3		E16.3			
CD4566B			E16.3			
CD4572UB			E16.3			
CD4585B	F16.3		E16.3	D16.3		
CD4724B	E16.3		E16.3			
CD7211			E40.6			
CD7211A			E40.6			
CD7211AM			E40.6			
CD7211M			E40.6			
CD14538B	F16.3		E16.3	D16.3		
CD22402			E24.6	D24.6		
CD22777			E8.3			
CD40100B			E16.3	D16.3		
CD40102B	F16.3		E16.3	D16.3		
CD40103B	F16.3		E16.3	D16.3		
CD40105B	F16.3	K16.D	E16.3	D16.3		
CD40106B		K14.B	E14.3	D14.3		
CD40107B	F14.3		E8.3	D14.3		
CD40109B	F16.3	K16.D	E16.3	D16.3		
CD40110B			E16.3			
CD40116			E22.4	D22.4A		
CD40117B			E14.3			
CD40147B	F16.3		E16.3			
CD40160B	F16.3		E16.3			
CD40161B	F16.3		E16.3	D16.3		
CD40163B	F16.3		E16.3	D16.3		
CD40174B	F16.3		E16.3	D16.3		
CD40175B	F16.3		E16.3			
CD40192B	F16.3		E16.3	D16.3		
CD40193B	F16.3		E16.3	D16.3		
CD40194B		K16.D	E16.3	D16.3		
CD40257B	F16.3		E16.3	D16.3		



Package outlines and dimensions are available in Section 10.

HI-REL/MILITARY AND RAD HARD

9

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New High-Reliability/Military Products

HA5022/883
DUAL VIDEO CURRENT FEEDBACK AMPLIFIER

AnswerFAX DOCUMENT # 3729

- Individual Output Enable/Disable
- Wide Unity Gain Bandwidth 125MHz
- Slew Rate. 475V/μs
- Differential Gain 0.03%
- Differential Phase. . . . . 0.03 Degrees
- Supply Current (per Amplifier) 7.5mA
- Crosstalk Rejection at 10MHz . . . . . -60dB

HA5023/883
DUAL VIDEO CURRENT FEEDBACK AMPLIFIER

AnswerFAX DOCUMENT # 3730

- Wide Unity Gain Bandwidth 125MHz
- Slew Rate. 475V/μs
- Differential Gain 0.03%
- Differential Phase. . . . . 0.03 Degrees
- Supply Current (per Amplifier) 7.5mA
- Crosstalk Rejection at 10MHz . . . . . -60dB

HFA3127/883
ULTRA HIGH FREQUENCY TRANSISTOR ARRAY

AnswerFAX DOCUMENT # 3967

- NPN Transistor (f_T) . . . . . 8GHz (Typ)
- NPN Current Gain . . . . . 40 (Min)
- NPN Early Voltage (VA) . . . . . 20 (Min)
- Noise Figure (50Ω) at 1.0GHz . . . . . 3.5dB (Typ)
- Collector-to-Collector Leakage . . . . . <1pA (Typ)
- Complete Isolation Between Transistors
- Pin Compatible with Industry Standard 3XXX Series

See Section 1 for complete selection guide, page number reference, and file number listing.

High-Reliability/Military Products

Selecting High-Reliability/Military Integrated Circuits and Discretes

- Identify the basic Harris device needed using the Product Line sections of this guide. Harris has local/geographic and central applications people to assist the design engineer or buyer in this effort.
- Review the data sheet detail to determine if the specific electrical and physical characteristics will meet your requirement. This data sheet can be obtained via the Harris AnswerFAX system or a specific product data book.
- Determine the specific part number by using the appropriate Part Number Nomenclature Guide in this section.
- Use the High-Reliability/Military and Rad Hard Part Number Listing located in this section to verify that the specific product and package option chosen is currently offered by Harris.
- Cross-Reference to a QML-JAN or QML-DESC/SMD Part Number option if required by your program/contract.

Harris Semiconductor products are designed to meet the needs of military and aerospace users. Harris provides High-Reliability semiconductors that are fully compliant with the following standards.

QML - MIL-STD-883 STANDARD MILITARY INTEGRATED CIRCUITS

- High-Reliability Products that are Processed to Harris Data Sheet Requirements
- MIL-STD-883 Compliant Process Flows
  - Class B. . . . . /3A, /883, /883B Suffixes
  - Class S. . /883S, /MS Suffix and Per Customer Drawing
- MIL-STD-883 Non-Compliant Process Flows
  - Class B. . . . . /3, -8, /3W, /HR, /B Suffixes
  - Class S . . . . . MS Suffix, -Q, /1
- Process Flows/Testing Altered to Customer Specification
- QML Transitional Certification to Appendix A of MIL-I-38535B for Compliant Devices

QML - JAN MIL-I-38535 INTEGRATED CIRCUITS

- Fully Compliant to Requirements of MIL-I-38535 and MIL-STD-883
- JAN Qualified Manufacturer
- List (QML) Maintained By DESC
- All Specification Changes Must Be Approved By DESC
- QML Transitional Certification to Appendix A of MIL-I-38535B

MIL-S-19500 - DISCRETES

- Specification for JAN Type Discrete Semiconductor Devices (i.e.: Transistors, Diodes, etc.)
- Qualified Parts List (QPL-19500) Maintained By DESC

QML - SMD/DESC INTEGRATED CIRCUITS

- All Specifications Issued and Controlled By DESC
- Fully Compliant to Requirements of MIL-STD-883 Class B
- QML Transitional Certification to Appendix A of MIL-I-38535B

See Section 1 for complete selection guide, page number reference, and file number listing.

QUALIFIED MANUFACTURERS LIST (QML)

Harris Semiconductor has received "Transitional Certification" for QML, and is proceeding on schedule to be fully QML certified by mid-1995. The products approved under QML include all JAN (Class B & S), DESC Standard Microcircuit Drawings (SMD's), and MIL-STD-883 compliant IC devices.

Note that Discrete Power products fall under MIL-S-19500, MIL-R-83530, and MIL-STD-750 and are not presently a part of the QML program.

The QML program utilizes a "best commercial practices" philosophy to manufacture integrated circuits for all classes of military products. This QML philosophy ties directly into existing Harris systems and programs such as statistical process control and utilization of continuous improvement teams to continually raise product quality, reliability, manufacturability, and performance.

The transition to this culture will eliminate the need for much of the present end-of-line testing which was required at a time when quality was inspected into the product rather than manufactured into the product.

In association with QML, MIL-I-38535 will allow plastic packages and reduced temperature ranges of product.

Harris presently has various commercial and industrial grades of product which are being processed in Wafer Fab, Assembly and Test facilities which will be fully QML certified.

Harris Semiconductor will continue to lead the industry in offering to our customers the complete range of SMD and MIL-STD-883 military compliant products under the new QML system.

QML - JAN MIL-I-38535

Harris JAN products are fabricated in the United States, and processed through assembly and test either in the US or at offshore locations. They are fully compliant to all requirements listed in MIL-I-38535 and MIL-STD-883, and are processed under the QML program. The JAN specifications are maintained and controlled by DESC, and any change to these specifications must be approved by DESC. A part number nomenclature guide is located in the Ordering Information of this section.

All of these JAN drawing numbers are listed/approved in DESC Publication QML-38535.

QML - SMD/DESC

Harris offers a broad range of Standard Microcircuit Drawing (SMD) products that were previously referred to as "DESC Drawings". These devices are processed in full compliance to MIL-STD-883, Class B, and are tested to electrical specifications that are issued and controlled by DESC. These items are processed under the QML program. A part number nomenclature guide is located in the Ordering Information of this section.

All of these SMDS are listed/approved in DESC Publication MIL-BUL-103.

MIL-S-19500 JAN TX/TXV POWER MOSFETS

DESC QPL-19500 approved part numbers are in the "2NXXXX" series (which are cross referenced to the FRXXXXXXX parts): specific devices can be selected by using the table titled QPL Approved JANTX/TXV Power MOSFETs.

MIL-R-83530 METAL OXIDE VARISTORS (MOV's)

DESC QPL (MIL-R-83530) part numbers are prefixed by "M83530/"; the four types presently available are described under Varistors Ratings and Characteristics.

DESC Source Control Drawings, based on MIL-R-83530, are prefixed by the numbers 87063 and 90065.

Harris also offers 29 types of TX equivalent devices which fall in the "V" prefix series of MOV's, and have a "TX" in the middle of the part number. A part number nomenclature guide is located in the Ordering Information of this section.

POWER MOSFETS - RAD HARD

FR prefix part numbers are radiation-hardened power MOSFETS in four reliability grades. A part number nomenclature guide is located in the Ordering Information of this section.

ISO9000

Harris Semiconductor's wafer fabrication and IC assembly and test operations have received ISO9002 certification. The certification for this international standard was achieved with minimal effort due to our years of performance in the military market, coupled with our implementation of a Total Quality Management system. Harris' TQM system and ISO compliance, combined, provide a synergetic quality system which fully supports the Harris Corporate Quality policy.

High-Reliability/Military Ordering Information

CA3000 LINEAR SERIES NOMENCLATURE GUIDE

CA3130 T 3

PART NUMBER
CAxxxx
HR3Nxxx

PACKAGE DESIGNATOR
D: Dual-In-Line Metal-Seal Ceramic
F: Dual-In-Line Frit-Seal Ceramic
T: TO-5 Metal Can
S: DIL Formed TO-5
J: Leadless Chip Carrier

RELIABILITY SCREENING LEVEL
/3: -55°C to +125°C Modified Class B
/3W: Modified Class B without High & Low Temperature DC

NOTES:
1. Dual Gate FETs are in TO-72 packages.
2. CA3089F is screened to commercial limits only.

HFA SERIES NOMENCLATURE GUIDE

H FA 1100 M B /883

PREFIX
H: Harris

FAMILY
FA: Ultra-High Speed Analog

PART NUMBER

TEMPERATURE
I: Industrial, -40°C to +85°C
M: Military/883, -55°C to +125°C

PACKAGE
B: Small Outline, SOIC
J: Ceramic DIP
P: Plastic DIP
Y: Dice
L: Ceramic LCC

HIGH-RELIABILITY DESIGNATOR
/883: Fully Compliant to MIL-STD-883 Class B/QML

ICL/ICM SERIES NOMENCLATURE GUIDE

All Part Numbers consist of a Device Family Prefix, a Basic Numeric Part Number, and an Option Suffix, as follows:

1, 2 or 3 Digit Prefix	3, 4 or 5 Digit Unique Device Number	3 or 4 Digit Option Suffix	High-Reliability Designator
XXX	XXX X	X X X X	/883B

- Pin Count Designator
- Package Type Designator
- Temperature Range Designator
- Electrical Option Designator Only. Used if more than one electrical option is available.
- Variation of basic device type designator. Only used if more than one basic device is available.
- 3 or 4 digit basic device type part number
- Device family prefix

DEVICE FAMILY PREFIXES

PREFIX	DEVICE FAMILY
ICL	Linear IC
ICM	Microperipheral IC

PACKAGE TYPE DESIGNATORS

SUFFIX	PACKAGE
B	Small Outline IC (SOIC)
J	Ceramic Dual-In-Line (CerDIP)
P	Plastic Dual-In-Line (PDIP)
T	TO-99, TO-100 Can
D	Sidebrazed Dual-In-Line (SBDIP)
S	TO-52 Can

TEMPERATURE RANGE DESIGNATORS

SUFFIX	TEMPERATURE RANGE
I	Industrial: Either -25°C to +85°C or -40°C to +85°C (Specified on Data Sheet)
M	Military: -55°C to +125°C

PIN COUNT DESIGNATOR

SUFFIX	PIN COUNT	DIAMETER
A	8	
B	10	
C	12	
D	14	
E	16	
G	20	
I	28	
L	40	
Q	2	
V	8	0.200″ pin circle, isolated case
W	10	0.230″ pin circle, isolated case
X	10	0.230″ pin circle, case to pin 5
Y	8	0.200″ pin circle, case to pin 4
Z	8	0.230″ pin circle, case to pin 5

See Section 1 for complete selection guide, page number reference, and file number listing.

I-SERIES NOMENCLATURE GUIDE

IH 5043 M J E /883B

DEVICE FAMILY

BASIC PART NUMBER

TEMPERATURE RANGE
M: -55°C to +125°C

PACKAGE TYPE DESIGNATOR
B: SOIC
D: Ceramic Sidebrazed Dual-In-Line
J: CerDIP Dual-In-Line
P: Ceramic DIP
T: TO-5 Type (also TO-78, TO-99, TO-100)

HIGH-RELIABILITY DESIGNATOR
/883B: -55°C to +125°C Fully Compliant to MIL-STD-883, Class B/QML
/HR: -55°C to +125°C, Non-Compliant
/BI: With Burn-In

PIN COUNT DESIGNATOR
A: 8
D: 14
E: 16
P: 20
W: 10 (0.230" pin circle isolated case)

H SERIES NOMENCLATURE GUIDE

Harris products are designated by "Harris Product Code". These products will always begin with the letter "H" and specific device numbers are isolated by hyphens. An example product code is show below. When ordering, please refer to products by the full code identification.

H A 1 - 2400 - /883

PREFIX
H: Harris

FAMILY
A: Analog
C: Communications
D: Digital
F: Filters
I: Interface
M: Memory
V: Analog High Voltage

PACKAGE
1: Ceramic Dual-In-Line (DIP)
1B: Ceramic Sidebrazed DIP
2: Metal Can
4: Ceramic Leadless Chip Carriers (LCC)
5: Ceramic Substrate
6: Slimline DIP
7: Ceramic Mini-DIP
0: Chip Form

PART NUMBER

TEMPERATURE GRADE
-8: -55°C to +125°C Harris Class B Equivalent Devices for use in Military and Flight Systems
-Q: -55°C to +125°C Harris Class C Equivalent Devices for use in Spacecraft or High-Rel Applications
/883: Fully Compliant to MIL-STD-883, Class B/QML
-Bxxxx: Altered to Customer and Requirements B Spec
-Rxxxx Number is uniquely assigned to specific customer requirements
RH: Radiation-Hardened

HMU/HMA SERIES NOMENCLATURE GUIDE

H MU 16 J C - 35 /883

PREFIX
H: Harris

FAMILY
MU: Multiplier
MA: Multiplier/ Accumulator

DEVICE TYPE
16
17

PACKAGE
G: PGA

TEMPERATURE RANGE
I: Industrial, -40°C to +85°C
M: Military, -55°C to +125°C

HIGH-RELIABILITY DESIGNATOR
883: -55°C to +125°C Fully Compliant to MIL-STD-883, Class B/QML

PERFORMANCE GRADE

-35: 35ns	-60: 60ns
-45: 45ns	-65: 65ns
-55: 55ns	-75: 75ns

See Section 1 for complete selection guide, page number reference, and file number listing.

CD54HC/HCT NOMENCLATURE GUIDE

CD54HCT00 F 3A

PART NUMBER
HC: CMOS Compatible
HCU: CMOS Compatible Unbuffered
HCT: TTL Compatible

PACKAGE DESIGNATOR
F: Dual-In-Line Ceramic (CERDIP)

SCREENING LEVEL
/3A: Class B (883)
B: Class B MIL-I-38535

NOTES:
1. /3A is MIL-STD-883 Para 1.2.1.
2. /3A devices are dual marked with the SMD DESC drawing or standard microcircuit drawing.
3. B is JAN38510 Class B QML Device.

ADVANCED CMOS LOGIC NOMENCLATURE GUIDE

CD54 AC 00 F 3 A

PART NUMBER
AC: CMOS Compatible
ACT: TTL Compatible

PACKAGE DESIGNATOR
F: Dual-In-Line Ceramic (CERDIP)

SCREENING LEVEL
/3A: -55°C to +125°C Fully Compliant to MIL-STD-883, Class B/QML

NOTE: 1. /3A devices are dual marked with the DESC or Standard Microcircuit Drawing.

80CXX FAMILY NOMENCLATURE GUIDE

M D 80C86 - 2 /883

TEMPERATURE RANGE
M: -55°C to +125°C

PACKAGE
D: Ceramic DIP
R: Leadless Chip Carrier (LCC)
G: Pin Grid Array

PART NUMBER
80Cxxx: CMOS Microprocessor
82Cxxx: CMOS Peripherals

TEMPERATURE/GRADE
883: Fully Compliant to MIL-STD-883 Class B/QML
/B: -55°C to +125°C Modified Class B

SPEED DESIGNATION
Microprocessors
2: 8MHz
Blank: 5MHz
Peripherals
5: 5MHz
Blank: 8MHz

CDM, CDP, CMM, GP CMOS LSI NOMENCLATURE GUIDE

CDP1802 A C D 3

PART NUMBER
CDP18xx
CMMxxxx

REVISION
A: 1st
B: 2nd etc.

VOLTAGE
C: 5V Device
NON-C: 10V Device

PRODUCT ASSURANCE LEVEL
/3: Modified Class B
IRZ: Modified Class S Rad Hard 10^5

PACKAGE DESIGNATOR
D: Dual-In-Line
J: Leadless Chip Carrier
K: Flatpack

DIGITAL SIGNAL PROCESSING NOMENCLATURE GUIDE

H SP XXXXX J C - 15 /883

PREFIX
H: Harris

FAMILY
SP: Signal Processing

DEVICE TYPE
43XXX: Filters
45XXX: Special Function
48XXX: Image Processing
95XXX: Building Blocks

PACKAGE
G: PGA
D: CDIC
P: DIP
S: SOIC

TEMPERATURE RANGE
I: Industrial, -40°C to +85°C
M: Military, -55°C to +125°C

PERFORMANCE GRADE
-15: 15MHz
-20: 20MHz
-25: 25 or 25.6MHz
-27: 27MHz
-30: 30MHz
-33: 33MHz
-40: 40MHz

HIGH-RELIABILITY DESIGNATOR
883: -55°C to +125°C Fully Compliant to MIL-STD-883, Class B/QML

See Section 1 for complete selection guide, page number reference, and file number listing.

MOV - HI-REL SERIES TX EQUIVALENT DEVICES

V 130 L TX 2

- **V** = MOV
- **130** = ZA Series - MAX RMS Applied Voltage; LA Series - V_N (DC) Nominal Varistor Voltage
- **L** = Z = ZA Series; L = LA Series
- **TX** = TX EQUIVALENT DEVICE
- **2** = For ZA Series Selection: A or B Clamping Voltage; For LA Series Selection: A, B - Clamping Voltage; C - Enhanced Performance Series

SMD/DESC - QML NOMENCLATURE GUIDE

5962 - 8XXXX 0X M X X

- **5962** = SMD ID NUMBER (Does Not Change) (ID Not Applicable in Earlier DESC Items)
- **8XXXX** = DESC AND SMD (Drawing Number)
- **0X** = DEVICE TYPE (Paragraph 1.2.1 Of SMD/DESC Drawing)
- **M** = DEVICE CLASS DESIGNATOR (If Applicable)
- **X** = PACKAGE OUTLINE

PACKAGE OUTLINE	
LETTER = TERMINALS	CASE OUTLINE
C = 14	D-1
E = 16	D-2
R = 20	D-8
J = 24	D-3

- **X** = LEAD FINISH: A = Solder Dip; C = Gold

JAN-QML NOMENCLATURE GUIDE

JM38510 / 051 51 S C A

- **JM38510** = GENERAL SPECIFICATIONS
- **/** = RADIATION IDENTIFIER: /: No Radiation Testing; R: 10^5 RAD (Si); H: 10^6 RAD (Si)
- **051** = DETAIL SPECIFICATIONS
- **51** = SPECIFIC DEVICE
- **S** = DEVICE CLASS: S: Class S/QML; B: Class B/QML
- **C** = PACKAGE OUTLINE
- **A** = LEAD FINISH: A: Solder; C: Gold

QML = Transitional QML
Certification to Appendix A of MIL-I-38535A.

See Section 1 for complete selection guide, page number reference, and file number listing.

RAD HARD CD4000 LOGIC STANDARD NOMENCLATURE GUIDE

CD4000B D MS H

PART NUMBER
CD4000B

PACKAGE DESIGNATOR
D: Dual-In-Line Metal-Seal Ceramic
K: Flatpack (Non MIL-STD-1835)
F: Dual-In-Line Frit-Seal Ceramic
J: Leadless Chip Carrier Ceramic

RELIABILITY SCREENING LEVEL
MS: Harris Modified Class S
/3A: MIL-STD-883, Class B/QML
/3: Class B Modified

When used indicates radiation levels

HARDNESS ASSURANCE LEVEL
R: 10^5 RAD (Si)
H: 10^6 RAD (Si)

NOTES:
1. "D" Package has a solder dipped lead finish (MIL-I-38535 lead finish "A").
2. "K" Package has a solder dipped lead finish (MIL-I-38535 lead finish "A").
3. "F" Package has a solder dipped tin plate (MIL-I-38535 lead finish "A").
4. "MS" devices are in full compliance with MIL-STD-883, para. 1.2.1 when the optional Group B and Group D conformance tests are performed.
5. /3A and /3 product is not available in Rad Hard versions.

RAD HARD CD4000 LOGIC MIL-STD NOMENCLATURE GUIDE

CD4000 B F S R

PART NUMBER
CD4000

SERIES
A
B

PACKAGE DESIGNATOR
Q: Flatpack (MIL-M-38510 Designator "N" or "T")
F: Dual-in-Line (MIL-M-38510 Designator "C" or "E")

CLASS
S: Class S
B: Class B

HARDNESS ASSURANCE LEVEL
R: 10^5 RAD/(Si)
H: 10^6 RAD/(Si)

RAD HARD POWER MOSFET NOMENCLATURE GUIDE

FR X XXXX X X

HARRIS RADIATION HARDENED POWER MOSFET

PACKAGE DESIGNATION
M: TO-204AA (TO-3 with 40 mil diameter leads)
K: TO-204AE (TO-3 with 60 mil diameter leads)
L: TO-205AF (TO-39 with Low Profile Cap)
F: TO-254AA
S: TO-257AA
E: TO-258AA

DIE DESIGNATION
All Numeric Characters
N-Channel (Three Digits) - XXX
P-Channel (Four Digits) - 9XXX

RADIATION (TOTAL DOSE) ASSURANCE LEVEL
D: 10kRAD (Si)
R: 100kRAD (Si)
H: 1000kRAD (Si)

RELIABILITY SCREENING LEVEL
1: Non-TX (Commercial)
2: TX Equivalent of MIL-S-19500
3: TXV Equivalent of MIL-S-19500
4: Space Equivalent of MIL-S-19500

See Section 1 for complete selection guide, page number reference, and file number listing.

RAD HARD ADVANCED AND HIGH SPEED LOGIC NOMENCLATURE GUIDE

HCS74 K MS R

PART NUMBER
ACS/HCS: CMOS Compatible
ACTS/HCTS: TTL Compatible

PACKAGE DESIGNATOR
K: Flatpack
D: Dual-in-Line Braze Seal Ceramic

RELIABILITY SCREENING LEVEL
MS: Modified Class S

HARDNESS ASSURANCE LEVEL
HCS/HCTS: R = 2 x 10^5 RAD(Si)
ACS/ACTS: R = 3 x 10^5 RAD(Si)

NOTES:

1. The "CD54" prefix is dropped for Class S HCS/HCTS device types.
2. Both Packages have gold plated lead finish (38510 lead finish "C").
3. /SAMPLE following the package designator indicates a +25°C temperature tested unit for design-in/breadboarding - NOT FOR FLIGHT.

HS SERIES RAD HARD HIGH RELIABILITY NOMENCLATURE GUIDE

H S 1 - 6617 RH -8

PREFIX
H: Harris

FAMILY
Rad Hard/High-Rel Products

PACKAGE
0: Die
1: Ceramic DIP
2: TO-99 Metal Can
4: Leadless Chip Carrier (LCC)
5: Ceramic Substrate
7: Mini DIP
8: Pin Grid Array
9: Flatpack

HARDNESS
RH: Radiation Hardened
BLANK: Non Rad Hard

PART NUMBER

TEMPERATURE GRADE
-8: -55°C to +125°C
Harris Class B Equivalent Devices
/SAMPLE: +25°C Design-In Unit
/PROTO: -55°C to +125°C Design-In Unit
-Q: -55°C to +125°C
Harris Class S Equivalent Devices
-BXXXX: or -RXXXX Rad Hard/High-Rel Devices - Altered to Customer Specs. Spec Number is Uniquely Assigned to Specific Customer Requirements
/883: Fully Compliant to MIL-STD-883 Class B/QML
/883S: Fully Compliant to MIL-STD-883 Class S/QML

NOTES:

1. /SAMPLE following the hardness designator indicates a +25°C temperature tested unit for design-in/breadboarding - NOT FOR FLIGHT.
2. /PROTO following the hardness designator indicates a -55°C to +125°C temperature tested unit for design-in/breadboarding - NOT FOR FLIGHT.

See Section 1 for complete selection guide, page number reference, and file number listing.

Product Flow Charts

PRODUCT FAMILY	MIL-STD-883 CLASS B							MIL-STD-883 CLASS S		
	COMPLIANT			NON-COMPLIANT				COMPLIANT	NON-COMPLIANT	
	/3A	/883	/883B	/3	/B	/3W	-8	/883S	/MS	-Q
CD4000 Series CMOS Logic	X	-	-	X	-	-	-	-	X	-
High Speed CMOS Logic CD54HC/HCT	X	-	-	-	-	-	-	-	-	-
Advanced CMOS Logic CD54AC/ACT	X	-	-	-	-	-	-	-	-	-
Rad Hard SOS Logic HCS/HCTS	-	-	-	-	-	-	-	-	X	-
Rad Hard SOS Logic ACS/ACTS	-	-	-	-	-	-	-	-	X	-
80CXXX Family MD, MG, MR	-	X	-	-	X	-	-	-	X	X
Digital LSI HD, HM, HSP	-	X	-	-	-	-	X	-	-	X
Digital LSI CDM, CDP, CMM	-	-	-	X	-	-	-	-	-	-
Rad Hard LSI HS	-	-	-	-	-	-	X	X	-	X
Linear HA, HC, HI, HFA, HV, H	-	X	-	-	-	-	X	-	-	X
Linear CA	-	-	-	X	-	X	-	-	-	-
Intersil Linear/Digital IH, ICL, ICM	-	-	X	-	-	-	-	-	-	-

HARRIS MILITARY INTEGRATED CIRCUITS

Features

Harris offers high-reliability products that are processed to Harris data sheet requirements. These products are identified by a unique suffix depending on the product type and may by fully compliant to MIL-STD-883 or MIL-STD "equivalent" product Class B or Class S type applications. In addition, Harris will alter process flows and testing to meet unique customer requirements. A unique part number is assigned to each customer circuit.

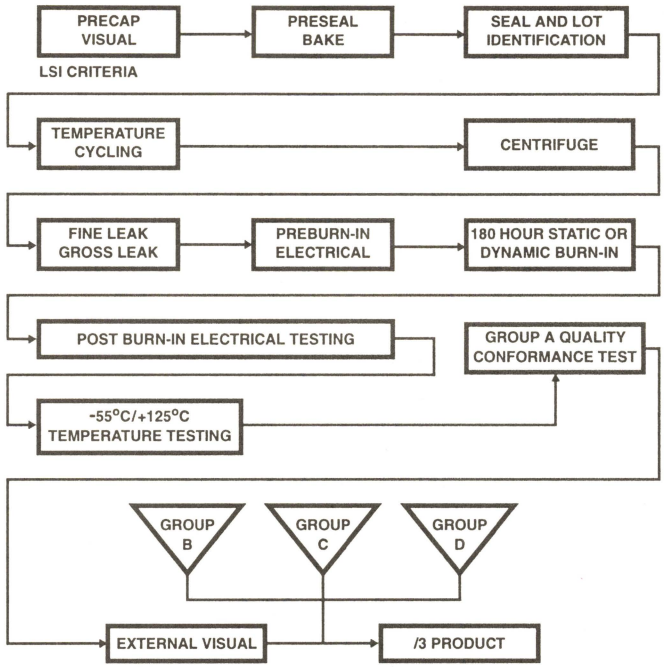
- MIL-STD-883 Compliant Process Flows
  The Following Process Flows are in Full Accordance with MIL-STD 883
  - Class B . . . . . /3A, /883, /883B
  - Class S . . . . . /883S
- MIL-STD-883 Non-Compliant Process Flows
  Class B
  - /3 : Meets Most Requirements of MIL-STD-883
  - /3W : Same as 3 without High and Low Temperature DC tests
  - -8 : Meets Most Requirements of MIL-STD-883
  - /B : Meets Most Requirements of MIL-STD-883
- MIL-STD-883 Non-Compliant Process Flows
  Class S
  - -Q : Meets Most Requirements of MIL-STD-883
  - /MS : Modified Class S, Rad Hard

Comparison of Class S/Class B Screening Tests

SCREENING TEST	CLASS S	CLASS B
Glassivation Thickness	Yes	-
SEM Inspection	Yes	-
Thermal Stability	Yes	-
Metallization Thickness	Yes	-
Non-Destructive Bond Pull	Yes	-
Precap Visual Inspection	Yes	Yes
Temperature Cycling	Yes	Yes
Constant Acceleration	Yes	Yes
Serialization	Yes	-
Fine and Gross Leak Test	-	Yes
Preburn Electrical	Yes	Yes
24Hr. Static Burn-In, Inputs Low at 135°C	Yes	-
24Hr. Static Burn-In, Inputs Low at 135°C	Yes	-
120Hr. Static Burn-In at 135°C	-	Yes
180Hr. Dynamic Burn-In at 135°C	Yes	-
Final Electrical Test	Yes	Yes
Fine and Gross Leak Tests	Yes	-
Radiographic Inspection	Yes	-

See Section 1 for complete selection guide, page number reference, and file number listing.

/3 FLOW

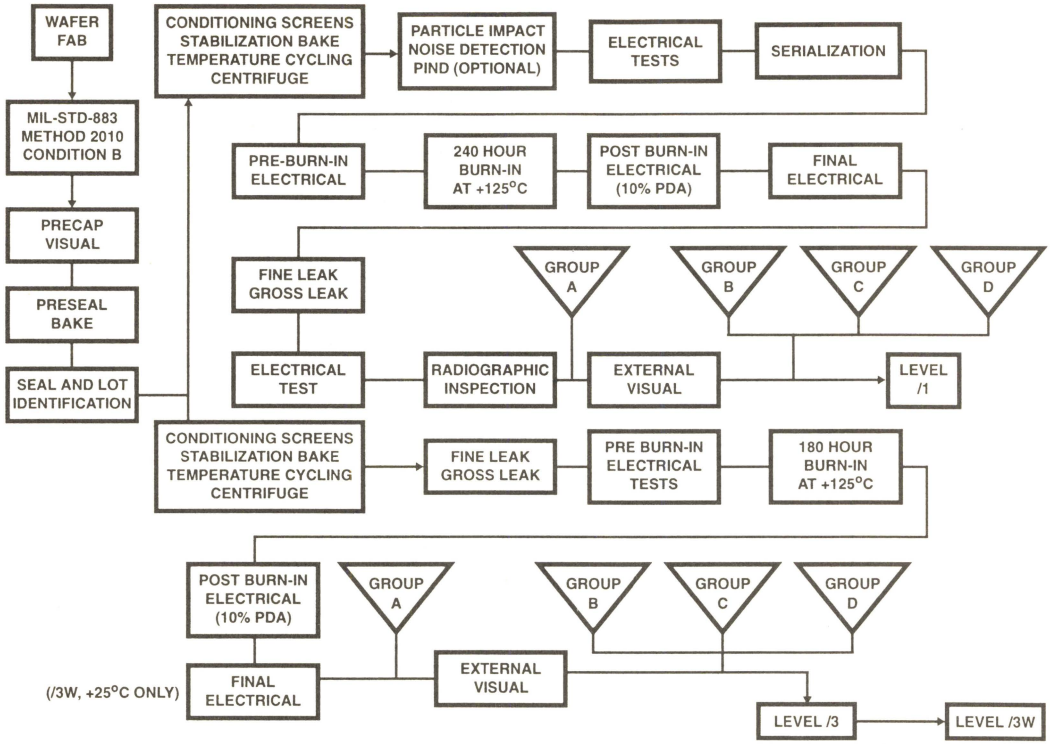


Data Supplied with /3 Product Consists of:

1. A certificate of processing and screening compliance.
2. An attribute summary of Group A results.
3. Group B, C and D attribute test results (when ordered), C of C is provided.
4. Generic B, C and D data is not maintained or offered.

See Section 1 for complete selection guide, page number reference, and file number listing.

/3W FLOW



Groups B, C, And D Are Performed On A Customer Basis Only (When Ordered) As For Class B
Note: Generic B, C, And D Data Is Not Maintained Or Offered.

See Section 1 for complete selection guide, page number reference, and file number listing.

TYPICAL PRODUCT FLOW: -8, /B, -Q, /MS FLOWS

OPERATION DESCRIPTION	/B AND -8	-Q, /MS
Silicon Chemicals	Yes	Yes
Quality Control Incoming Inspection	Yes	Yes
Wafer Fabrication	Yes	Yes
Quality Control Process Inspection	Yes	Yes
SEM Inspection	Rad Hard Only	Yes
Wafer Lot Accept	Rad Hard Only	Yes
Wafer Electrical Probe	Yes	Yes
Wafer Scribe, Break	Yes	Yes
Dice Visual Screen	2010 Condition B	2010 Condition A
Quality Control Sample Dice Inspection	Yes	Yes
Package Piece Parts	Yes	Yes
Quality Control Incoming Inspection	Yes	Yes
Die Mount	Yes	Yes
Bond Wire	Yes	Yes
Quality Control Incoming Inspection	Yes	Yes
Wire Bonding	Yes	Yes
Quality Control Bond Inspection	2010 Condition B	2010 Condition A
100% Bond Pull Test Method 2023	No	Yes
Pre-Seal Visual Screen	2010 Condition B	2010 Condition A
Quality Control Pre-Seal Visual Lot Acceptance	Yes	Yes
Pre-Seal Bake Method 1008, Condition C	Yes	Yes

OPERATION DESCRIPTION	/B AND -8	-Q, /MS
Package List (Piece Parts)	Yes	Yes
Quality Control Incoming Inspection	Yes	Yes
Package Seal	Yes	Yes
Quality Control Seal Inspection	Yes	Yes
Temperature Cycle Method 1010, Condition C, 10 Cycles	Yes	Yes
Centrifuge Method 2001, Y_1 Axis	Yes	Yes
PIND Test	No	Yes
Fine Leak Method 1014	Yes	Yes
Gross Leak Method 1014	Yes	Yes
Frame Removal, Load Carrier or Tubes	Yes	Yes
Quality Control Package Assembly Lot Acceptance	Yes	Yes
Serialization	No	Yes
X-Ray	No	Yes
Initial Electrical Test	Yes	Yes
Burn-In	Yes	Yes
Final Electrical Test	Yes	Yes
Fine Leak Method 1014	Yes	Yes
Gross Leak Method 1014	Yes	Yes
Quality Control Lot Acceptance	Yes	Yes
Part Marking	Yes	Yes
QCI Group B, C, D or E (Note 1)	As Required and Ordered	As Required and Ordered

NOTE:

1. Generic B, C and D data is not maintained or offered.

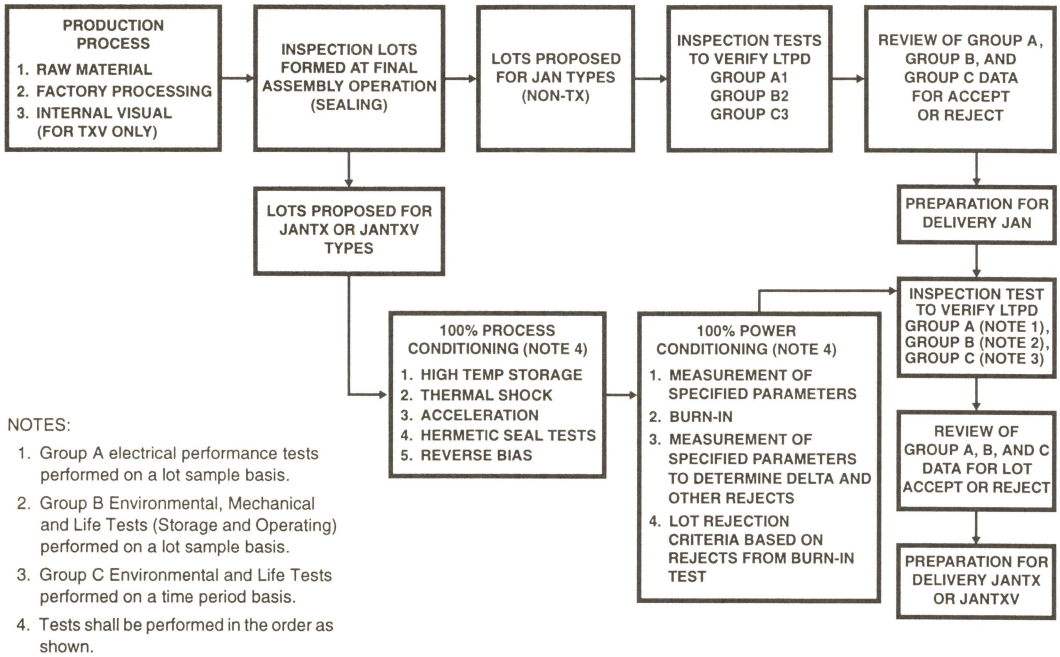
See Section 1 for complete selection guide, page number reference, and file number listing.

Power Transistors

JAN, JANTX, JANTXV, 2NXXXX Series Devices

MIL-S-19500 is the specification for the familiar "JAN" type discrete semiconductor devices. Detailed electrical specifications are prepared as needed by the three military services and coordinated by the Defense Electronic Supply Center (DESC). Levels of reliability are defined by MIL-S-19500. JAN types receive Group A, Group B, and Group C lot sampling only, and are subjected to lot rejection based on delta parameter criteria in addition to Group A, Group B, and Group C lot sampling. JANTXV types are subjected to 100% (JTXV) internal visual inspection in addition to all of the JANTX tests in accordance with MIL-STD-750 test methods and MIL-S-19500.

DESC publishes "QPL-19500", a Qualified Products List of all types and suppliers approved to produce and brand devices in accordance with MIL-S-19500.



NOTES:

1. Group A electrical performance tests performed on a lot sample basis.
2. Group B Environmental, Mechanical and Life Tests (Storage and Operating) performed on a lot sample basis.
3. Group C Environmental and Life Tests performed on a time period basis.
4. Tests shall be performed in the order as shown.

ORDER OF PROCEDURE DIAGRAM FOR JAN, JANTX, AND JANTXV SEMICONDUCTOR POWER DEVICES

See Section 1 for complete selection guide, page number reference, and file number listing.

QPL JANTX/TXV Power MOSFET Selection Guide

QPL APPROVED JANTX/TXV POWER MOSFETs

PART NUMBER	MIL-S-19500/	LEVEL		PACKAGE	P_T (W)	I_D (A)	BV_{DSS} (V)	$r_{DS(ON)}$ (Ω)
		TX	TXV					
N-CHANNEL TYPES								
2N6756	542	X	X	TO-204AA	75	14	100	0.18
2N6758	542	X	X	TO-204AA	75	9	200	0.4
2N6760	542	X	X	TO-204AA	75	5.5	400	1.0
2N6762	542	X	X	TO-204AA	75	4.5	500	1.5
2N6764	543	X	X	TO-204AE	150	38	100	0.055
2N6766	543	X	X	TO-204AE	150	30	200	0.085
2N6768	543	X	X	TO-204AA	150	14	400	0.3
2N6770	543	X	X	TO-204AA	150	12	500	0.4
2N6782	556	X	X	TO-205AF	15	3.5	100	0.6
2N6784	556	X	X	TO-205AF	15	2.25	200	1.5
2N6786	556	X	X	TO-205AF	15	1.25	400	3.6
2N6788	555	X	X	TO-205AF	20	6	100	0.3
2N6790	555	X	X	TO-205AF	20	3.5	200	0.8
2N6792	555	X	X	TO-205AF	20	2	400	1.8
2N6794	555	X	X	TO-205AF	20	1.5	500	3.0
2N6796	557	X	X	TO-205AF	25	8	100	0.18
2N6798	557	X	X	TO-205AF	25	5.5	200	0.4
2N6800	557	X	X	TO-205AF	25	3	400	1.0
2N6802	557	X		TO-205AF	25	2.5	500	1.5
2N7224	592	X	X	TO-254AA	150	34	180	0.07
2N7225	592	X	X	TO-254AA	150	27.4	200	0.1
2N7227	592	X	X	TO-254AA	150	14	400	0.315
2N7228	592	X	X	TO-254AA	150	12	500	0.415
N-CHANNEL LOGIC LEVEL TYPES								
2N6901	570	X	X	TO-205AF	8.33	1.69	100	1.4
2N6902	566	X	X	TO-204AA	12	75	100	0.2
2N6903	570	X		TO-205AF	8.33	0.98	200	3.65
2N6904	566	X		TO-204AF	75	8	200	0.65
P-CHANNEL TYPES								
2N6895	565	X	X	TO-205AF	8.33	1.5	100	3.65
2N6896	565	X		TO-204AA	60	6	100	0.6
2N6897	565	X	X	TO-204AA	100	12	100	0.3
2N6898	565	X	X	TO-204AE	150	25	100	0.2
2N6849	564	X	X	TO-205AF	25	6.5	100	0.3
2N6851	564	X	X	TO-205AF	25	4	200	0.8

See Section 1 for complete selection guide, page number reference, and file number listing.

HIGH-RELIABILITY SERIES MECHANICAL AND ENVIRONMENTAL TESTING FOR AEROSPACE, MILITARY, AND HIGH-RELIABILITY APPLICATIONS

The high-reliability Harris varistor is the latest step in increased product performance and is available for applications requiring assurance levels consistent with military or other standards (MIL-STD-19500, MIL-S-750, Method 202).

This series of high-reliability varistors involves five categories:

1. DESC Qualified Parts List (QPL) MIL-R-83530. 4 types presently available.
2. DESC Source Control Drawings based on MIL-R-83530. 63 types presently available - ZA radial series and DB industrial series.
3. Harris high-reliability series offers TX equivalents. 29 types presently available.
4. Custom types processed to customer-specific requirements - (SCD) or to standard military flow.
5. All MOVs are inherently resistant to radiation: Electron, Neutron, Gamma.

Credentials

Harris varistors and quality management systems are:

- DESC Approved
- QPL Listed
- CECC Approved
- ISO Approved
- UL Approved
- CSA Approved

DESC Qualified Parts List (QPL) MIL-R-83530

MIL-R-83530/1

PART NUMBER M83530/	NOMINAL VARISTOR VOLTAGE (V)	TOLERANCE (%)	VOLTAGE RATING (V)		ENERGY RATING (J)	CLAMPING VOLTAGE AT 100A (V)	CAPACITANCE AT 1MHz (pF)	CLAMPING VOLTAGE AT PEAK CURRENT RATING (V)	I_{TM} (A)	NEAREST COMMERCIAL EQUIVALENT
			(RMS)	(DC)						
1-2000B	200	±10	130	175	50	325	3800	570	6000	V130LA20B
1-2200D	220	+10, -5	150	200	55	360	3200	650	6000	V150LA20B
1-4300E	430	+5, -10	275	369	100	680	1800	1200	6000	V275LA40B
1-5100E	510	+5, -10	320	420	120	810	1500	1450	6000	V320LA40B

This series of varistors are screened and conditioned in accordance with MIL-R-83530 as outlined in the table below. Manufacturing system conforms to MIL-I-45208; MIL-Q-9858.

See Section 1 for complete selection guide, page number reference, and file number listing.

MIL-R-83530 GROUP A, B, AND C INSPECTIONS

INSPECTION		AQL (PERCENT DEFECTIVE)	MAJOR	MINOR	NUMBER OF SAMPLE UNITS	FAILURES ALLOWED
Group A	SUBGROUP 1					
	High Temperature Life (Stabilization Bake)	100%	-	-	-	-
	Thermal Shock	100%	-	-	-	-
	Power Burn-In	100%	-	-	-	-
	Clamping Voltage	100%	-	-	-	-
	Nominal Varistor Voltage	100%	-	-	-	-
	SUBGROUP 2					
	Visual and Mechanical Examination	-	1.0% AQL 7.6% LQ	25% AQL 13.0% LQ	Per Plan	-
	Body Dimensions	-			Per Plan	-
	Diameter and Length of Leads	-			Per Plan	-
	Marking	-			Per Plan	-
	Workmanship	-			Per Plan	-
	SUBGROUP 3					
	Solderability	-	-	-	Per Plan	-
Group B	SUBGROUP 1					
	Dielectric Withstanding Voltage	-	-	-	Per Plan	-
	SUBGROUP 2					
	Resistance to Solvents	-	-	-	Per Plan	-
	SUBGROUP 3					
	Terminal Strength (Lead Fatigue)	-	-	-	Per Plan	-
	Moisture Resistance	-	-	-	Per Plan	-
	Peak Current	-	-	-	Per Plan	-
	Energy	-	-	-	Per Plan	-
Group C	EVERY 3 MONTHS					
	High Temperature Storage	-	-	-	10	0
	Operating Life (Steady State)	-	-	-	10	0
	Pulse Life	-	-	-	10	0
	Shock	-	-	-	10	0
	Vibration	-	-	-	10	0
	Constant Acceleration	-	-	-	10	0
	Energy	-	-	-	10	0

See Section 1 for complete selection guide, page number reference, and file number listing.

DESC Source Controlled Drawing # 87063

MIL-R-83530 ZA SERIES

87063 DASH NO.	NEAREST COMM. NO.	(NOTE 1) SIZE	MAXIMUM RATINGS (+85°C)				CHARACTERISTICS (+25°C)					
			CONTINUOUS		TRANSIENT		VARISTOR VOLTAGE at 1mA DC TEST CURRENT			MAXIMUM CLAMPING VOLTAGE V_C at TEST CURRENT (8/20μs)		TYPICAL CAPACITANCE
			RMS	DC	ENERGY (10/ 1000μs)	PEAK CURRENT (8/20μs)	MIN	$V_{N(DC)}$	MAX	V_C	I_C	f = 1MHz
			$V_{M(AC)}$	$V_{M(DC)}$	W_{TM}	I_{TM}						
			(V)	(V)	(J)	(A)	(V)	(V)	(V)	(V)	(A)	(pF)
001	V22ZA05	1	14	18	0.2	35	18.7	22	26	51	2	400
002	V22ZA1	2	14	18	0.9	150	18.7	22	26	47	5	1600
003	V22ZA2	3	14	18	2.0	350	18.7	22	26	43	5	4000
004	V22ZA3	4	14	18	4.0	750	18.7	22	26	43	10	9000
005	V24ZA50	5	14	18	6.5	1500	19.2	24 (Note 2)	26	43	20	18000
006	V27ZA05	1	17	22	0.25	35	23	27	31.1	59	2	300
007	V27ZA1	2	17	22	1.0	150	23	27	31.1	57	5	1300
008	V27ZA2	3	17	22	2.5	350	23	27	31.1	53	5	3000
009	V27ZA4	4	17	22	5.0	750	23	27	31.1	53	10	7000
010	V27ZA60	5	17	22	8.0	1500	23	27 (Note 2)	31.1	50	20	15000
011	V33ZA05	1	20	26	0.3	35	29.5	33	38	67	2	250
012	V33ZA1	2	20	26	1.2	150	29.5	33	36.5	68	5	1100
013	V33ZA2	3	20	26	3.0	350	29.5	33	36.5	64	5	2700
014	V33ZA5	4	20	26	6.0	750	29.5	33	36.5	64	10	6000
015	V33ZA70	5	21	27	9.0	1500	29.5	33 (Note 2)	36.5	58	20	13000
016	V36ZA80	5	23	31	10.0	1500	32	36 (Note 2)	40	63	20	12000
017	V39ZA05	1	25	31	0.35	35	35	39	46	79	2	220
018	V39ZA1	2	25	31	1.5	150	35	39	43	79	5	900
019	V39ZA3	3	25	31	3.5	350	35	39	43	76	5	2200
020	V39ZA6	4	25	31	7.2	750	35	39	43	76	10	5000
021	V47ZA05	1	30	38	0.4	35	42	47	55	90	2	200
022	V47ZA1	2	30	38	1.8	150	42	47	52	92	5	800
023	V47ZA3	3	30	38	4.5	350	42	47	52	89	5	2000
024	V47ZA7	4	30	38	8.8	750	42	47	52	89	10	4500
025	V56ZA05	1	35	45	0.5	35	50	56	66	108	2	180

See Section 1 for complete selection guide, page number reference, and file number listing.

MIL-R-83530 ZA SERIES (Continued)

87063 DASH NO.	NEAREST COMM. NO.	(NOTE 1) SIZE	MAXIMUM RATINGS (+85°C)				CHARACTERISTICS (+25°C)					
			CONTINUOUS		TRANSIENT		VARISTOR VOLTAGE at 1mA DC TEST CURRENT			MAXIMUM CLAMPING VOLTAGE V_C at TEST CURRENT (8/20μs)		TYPICAL CAPACITANCE
			RMS	DC	ENERGY (10/1000μs)	PEAK CURRENT (8/20μs)	MIN	$V_{N(DC)}$	MAX	V_C	I_C	f = 1MHz
			$V_{M(AC)}$	$V_{M(DC)}$	W_{TM}	I_{TM}						
			(V)	(V)	(J)	(A)	(V)	(V)	(V)	(V)	(A)	(pF)
026	V56ZA2	2	35	45	2.3	150	50	56	62	107	5	700
027	V56ZA3	3	35	45	5.5	350	50	56	62	103	5	1800
028	V56ZA8	4	35	45	10.0	750	50	56	62	103	10	3900
029	V68ZA05	1	40	56	0.6	35	61	68	80	127	2	150
030	V68ZA2	2	40	56	3.0	150	61	68	75	127	5	600
031	V68ZA3	3	40	56	6.5	350	61	68	75	123	5	1500
032	V68ZA10	4	40	56	13.0	750	61	68	75	123	10	3300
033	V82ZA05	1	50	66	1.2	70	73	82	97	145	2	120
034	V82ZA2	2	50	66	3.5	300	73	82	91	135	10	500
035	V82ZA4	3	50	66	7.3	750	73	82	91	135	25	1100
036	V82ZA12	4	50	66	13.0	1500	73	82	91	145	50	2500
037	V100ZA05	1	60	81	1.5	70	90	100	117	175	2	90
038	V100ZA3	2	60	81	4.3	300	90	100	110	165	10	400
039	V100ZA4	3	60	81	8.9	750	90	100	110	165	25	900
040	V100ZA15	4	60	81	16.0	1500	90	100	110	175	50	2000
041	V120ZA05	1	75	102	1.8	100	108	120	138	205	2	70
042	V120ZA1	2	75	102	5.3	400	108	120	132	205	10	300
043	V120ZA4	3	75	102	11.0	1000	108	120	132	200	25	750
044	V120ZA6	4	75	102	19.0	2000	108	120	132	210	50	1700
045	V150ZA05	1	92	127	2.3	100	135	150	173	240	2	60
046	V150ZA1	2	95	127	6.5	400	135	150	165	250	10	250
047	V150ZA4	3	95	127	13.0	1000	135	150	165	250	25	600
048	V150ZA8	4	95	127	23.0	2000	135	150	165	255	50	1400
049	V180ZA05	1	110	153	2.7	150	162	180	207	290	2	50
050	V180ZA1	2	115	153	7.7	500	162	180	198	295	10	200
051	V180ZA5	3	115	153	16.0	1500	162	180	198	300	25	500
052	V180ZA10	4	115	153	27.0	3000	162	180	198	300	50	1100

NOTES:

1. Size 1-5mm, 2-7mm, 3-10mm, 4-14mm, 5-20mm
2. Denotes 10mA DC test current.

See Section 1 for complete selection guide, page number reference, and file number listing.

DESC Standard Military Drawing # 90065

MIL-R-83530 DB SERIES

90065 DASH NO.	VOLTAGE RATING MAX. (RMS)	ENERGY MAX (J)	PEAK CURRENT (A)	NOMINAL VARISTOR VOLTAGE (V)		MAX CLAMPING VOLTAGE AT TEST CURRENT		TYPICAL CAPACITANCE (pF)
						(V)	(I)	
012	130	170	22500	200	+28, -16	345	200	10000
013	150	200	22500	240	±28	405	200	8000
014	250	270	22500	390	+39, -36	650	200	5000
015	275	300	22500	430	±43	730	200	4500
016	320	350	22500	510	+29, -48	830	200	3800
017	420	460	28800	680	+68, -70	1130	200	3000
018	480	510	28800	750	+74, -80	1240	200	2700
019	510	550	28800	820	+91, -85	1350	200	2500
020	575	600	28800	910	+95, -105	1480	200	2200
021	660	690	28800	1050	±110	1720	200	2000
022	750	810	28800	1200	±120	2000	200	1800

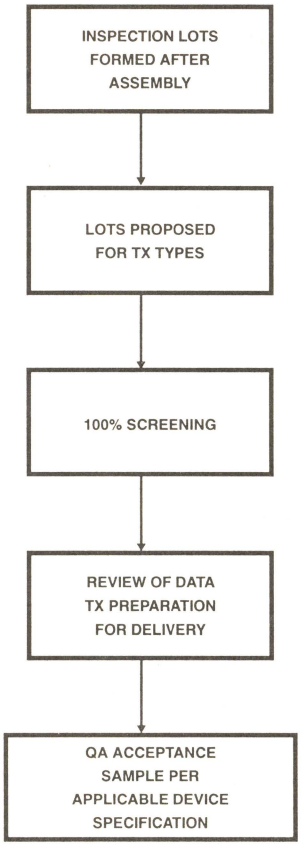
See Section 1 for complete selection guide, page number reference, and file number listing.

Harris High-Reliability Series TX Equivalents

TX MODEL TYPES

TX MODEL	MODEL SIZE	DEVICE MARK	NEAREST COMMERCIAL EQUIVALENT
V8ZTX1	7mm	8TX1	V8ZA1
V8ZTX2	10mm	8TX2	V8ZA2
V12ZTX1	7mm	12TX1	V12ZA1
V12ZTX2	10mm	12TX2	V12ZA2
V22ZTX1	7mm	22TX1	V22ZA1
V22ZTX3	14mm	22TX3	V22ZA3
V24ZTX50	20mm	24TX50	V24ZA50
V33ZTX1	7mm	33TX1	V33ZA1
V33ZTX5	14mm	33TX5	V33ZA5
V33ZTX70	20mm	33TX70	V33ZA70
V68ZTX2	7mm	68TX2	V68ZA2
V68ZTX10	14mm	68TX10	V68ZA10
V82ZTX2	7mm	82TX2	V82ZA2
V82ZTX12	14mm	82TX12	V82ZA12
V130LTX2	7mm	130TX	V130LA2
V130LTX10A	14mm	130TX10	V130LA10A
V130LTX20B	20mm	130TX20	V130LA20A
V150LTX2	7mm	150TX	V150LA2
V150LTX10A	14mm	150TX10	V150LA10A
V150LTX20B	20mm	150TX20	V150LA20B
V250LTX4	7mm	250TX	V250LA4
V250LTX20A	14mm	250TX20	V250LA20A
V250LTX40B	20mm	250TX40	V250LA40B
V420LTX20A	14mm	420TX20	V420LA20A
V420LTX40B	20mm	420TX40	V420LA40B
V480LTX40A	14mm	480TX40	V480LA40A
V480LTX80B	20mm	480TX80	V480LA80B
V510LTX40A	14mm	510TX40	V510LA40A
V510LTX80B	20mm	510TX80	V510LA80B

This series of varistors are 100% screened and conditioned in accordance with MIL-STD-750.



9 MILITARY GRADE/ HIGH-RELIABILITY

See Section 1 for complete selection guide, page number reference, and file number listing.

Harris Rad Hard ICs Converting to QML SMDs

A HARRIS RAD HARD IC PRODUCT STANDARDIZATION PLAN HAS BEEN IMPLEMENTED

The following questions and answers have been prepared for your reference.

WHAT DOES THIS MEAN?

- ALL of the more than 300 Harris Rad Hard IC products will be converted to QML SMDs by January 1, 1996 (Note 1).
  - If we offer Classes B and S Flows now for a device type, we will offer Classes Q and V under the SMD (Note 2).
  - If only Class S is offered then only Class V will be offered under the SMD.
  - The parts are the same, having the same packages and specifications. Only the number will change.
- Harris will not accept any more Rad Hard IC Source Control Drawing (SCD) business after January 1, 1996.
  - Custom brand will be offered, but only on the QML SMD flow.
  - QCI on a customer lot will be offered as an option, but it will be a standard QCI and the custom brand option will be required to be ordered with the QCI option.

WHY ARE WE DOING THIS?

- In order to stay competitive, we must reduce the complexity of how we do business.
  - Going to a single standard manufacturing flow per device type will reduce this complexity.
- In order to remain competitive we need to lower our customers' total cost of procurement.
  - Lower MLQs.
  - Shorten lead times.
  - Even lower MLQs and shorter lead times available through distribution.
  - Customers will not need to maintain an SCD infrastructure.
  - DESC will maintain configuration control on the SMDs.
  - Incoming inspections will be reduced or eliminated because all devices will be produced under SMD control.

HOW ARE WE PREPARING FOR THIS CHANGE?

- DESC is in the process of creating more than 300 SMDs for all Harris Rad Hard ICs.
- Harris manufacturing will be ready to produce parts to the new QML flows by September 30, 1995.
- As soon as an SMD is approved, the standard part will be offered to customers--watch for announcements.
- As was stated above, order entry for SCDs will remain open through December 30, 1995, but customers will be encouraged to buy standard parts as represented by the SMD rather than their SCD.
- We will start reviewing all customer drawings against the QML SMD flow by September 1, 1995.

Note that the Harris Rad Hard Power MOSFET products are not included in this standardization plan.

Should any of our customers need more information on the Harris plans to standardize its offerings of Rad Hard IC products, please contact the Harris Sales Office, Sales Representative, or Distributor in your area, or call Rad Hard IC Product Marketing at (407) 729-5869.

ACRONYM DEFINITIONS

DESC: Defense Electronic Supply Center. The Government entity administering the QML Program.

MLQ: Minimum Line Quantities. Also known as Minimum Order Quantity (MOQ).

QCI: Quality Conformance Inspection

QML: Qualified Manufacturer List

SCD: Source Control Drawing

SMD: Standard Microcircuit Drawing

NOTE:

1. Traditionally Class B is MIL-M-38510 Military Non-Rad-Hard, and Class S is Military Rad-Hard for Space applications.
2. Classes Q and V are the equivalent Class B and S Flows, respectively, for the new QML Specifications MIL-I-38535.

New Rad Hard Products

HS-0506RH, HS-0507RH, HS-0508RH, HS-0509RH ANALOG CMOS MULTIPLEXERS

AnswerFAX DOCUMENT # 3977 (HS-0508RH, HS-0509RH)

- Total Dose . . . . . 1 x 10^4 RAD(Si)
- Wide Analog Signal Range . . . . . ±15V
- Access Time 250ns
- Latch Up Free

HS-0546RH, HS-0547RH ANALOG MULTIPLEXERS WITH ACTIVE OVERVOLTAGE PROTECTION

AnswerFAX DOCUMENT # 3544 (HS-0546RH, HS-0547RH)

- Total Dose . . . . . 1 x 10^4 RAD(Si)
- Analog Signal Range . . . . . ±15V
- Guaranteed R_{ON} Matching
- Latch Up Free

HS-2520RH UNCOMPENSATED HIGH SLEW RATE OPERATIONAL AMPLIFIER

AnswerFAX DOCUMENT # 3599

- DI Bipolar Process
- Total Dose . . . . . 1 x 10^4 RAD(Si)

HS-2600RH WIDEBAND HIGH IMPEDANCE OPERATIONAL AMPLIFIER

AnswerFAX DOCUMENT # 3650

- DI Bipolar Process
- Total Dose . . . . . 1 x 10^4 RAD(Si)

HS-2620RH, HS-2622RH VERY WIDEBAND, HIGH INPUT IMPEDANCE UNCOMPENSATED OPERATIONAL AMPLIFIER

AnswerFAX DOCUMENT # 4014

- DI Bipolar Process
- Total Dose . . . . . 1 x 10^4 RAD(Si)

HS-2420RH FAST SAMPLE AND HOLD

AnswerFAX DOCUMENT # 3554

- Total Dose . . . . . .1 x 10^5 RAD(Si)
- Max Drift Current (Over Temp) 10nA
- Power Supply Rejection . . . . . ≥80dB

HS-6664RH RADIATION HARDENED 8K x 8 CMOS PROM

AnswerFAX DOCUMENT # 3197

- Total Dose . . . . . >3 x 10^5 RAD(Si)
- Transient Upset . . . . . 5 x 10^8 RAD(Si)/s
- Access Time 60ns
- LET . . . . . >100

HS-9008RH 8-BIT FLASH A/D CONVERTER

AnswerFAX DOCUMENT # 3279

- Total Dose . . . . . >3 x 10^5 RAD(Si)
- Low Power . . . . . .400mW (Typ)
- 20MHz Sampling Rate (50ns Conversion Time)
- Linearity . . . . . 0.5 LSB (Typ)

HS-RTX2010RH RAD HARD MICROCONTROLLER

AnswerFAX DOCUMENT # 3961

- Total Dose . . . . . .3 x 10^5 RAD(Si)
- SEU . . . . . <1 x 10^{-10} Errors/Bit-Day
- 8 MIPS Throughput
- Latchup Immune SOS Processing

See Section 1 for complete selection guide, page number reference, and file number listing.

FSFXXXD, FSFXXXR			
PART NUMBER	**DESCRIPTION**	**AnswerFAX NUMBER**	**FEATURES**
FSF150D	25A, 100V, Radiation Hardened, SEGR Resistant N-Channel Power MOSFETs	3971	• $r_{DS(ON)}$ • FSF150D, FSF150R. . . . . 0.070Ω • FSF254D, FSF254D. . . . . 0.170Ω • FSF450D, FSF450R. . . . . 0.600Ω • FSL430D . . . . . 2.50Ω • FSL430R . . . . . 2.50Ω • Maximum Power Dissipation at 25°C. . . . . 125W • Available in the TO-254AA Package
FSF150R		3971	
FSF254D	18A, 250V, Radiation Hardened, SEGR Resistant N-Channel Power MOSFETs	3972	
FSF254R		3972	
FSF450D	9A, 500V, Radiation Hardened, SEGR Resistant N-Channel Power MOSFETs	3970	
FSF450R		3970	
FSL430D	Radiation Hardened, SEGR Resistant N-Channel Power MOSFET	4010	
FSL430R	Radiation Hardened, SEGR Resistant N-Channel Power MOSFET	4010	

ACS/ACTS			
PART NUMBER	**DESCRIPTION**	**AnswerFAX NUMBER**	**FEATURES**
ACS00MS	Quad 2-Input NAND Gate	3563	• ACS Input Logic Levels - VIL = 30% of VCC Max - VIH = 70% of VCC Min • ACTS Input Logic Levels - VIL = 0.8V Max - VIH = VCC/2V Min • 1.25 Micron Radiation Hardened SOS CMOS • Total Dose 300K RAD (Si) • Single Event Upset (SEU) Immunity <1 x 10^{-10} Errors/Bit-Day (Typ) • SEU LET Threshold >80 MEV-cm^2/mg • Dose Rate Upset >10^{11} RAD (Si)/s, 20ns Pulse • Latch-Up Free Under Any Conditions • Military Temperature Range: -55°C to +125°C • Significant Power Reduction Compared to ALSTTL Logic • DC Operating Voltage Range: 4.5V to 5.5V • Input Current ≤1μA at VOL, VOH
ACS08MS	Quad 2-Input NAND Gate	3993	
ACS10MS	Triple Three-Input NAND Gate	3630	
ACS20MS	Dual 4-Input NAND Gate	3616	
ACS373MS	Octal Transparent Latch, Three-State	3999	
ACS374MS	Octal D Flip-Flop, Three-State	3997	
ACS86MS	Quad 2-Input Exclusive OR Gate	3995	
ACTS00MS	Quad 2-Input NAND Gate	3564	
ACTS08MS	Quad 2-Input AND Gate	3994	
ACTS10MS	Triple Three-Input NAND Gate	3631	
ACTS20MS	Dual 4-Input NAND Gate	3611	
ACTS373MS	Octal Transparent Latch, Three-State	4000	
ACTS374MS	Octal D Flip-Flop, Three-State	3998	
ACTS86MS	Quad 2-Input Exclusive OR Gate	3996	

Rad Hard Families of Products

OPERATIONAL AMPLIFIERS

Bipolar DI Process

- Neutron Fluence . . . . . 5×10^{12} n/cm^2 (E > 10KeV)
- Gama Rate. . . . . 1×10^2 RAD (Si)/s
- Gama Dose . . . . . $>1 \times 10^4$ RAD (Si)

SWITCHES

DICMOS Process

- Total Dose . . . . . $>1 \times 10^5$ RAD (Si)

MULTIPLEXERS

DICMOS Process

- Gama Rate. . . . . 1×10^8 RAD (Si)/s
- Gama Dose . . . . . 1×10^5 RAD (Si)
  1×10^4 RAD (Si)

CD4000 LOGIC

Hardened Bulk CMOS Process

- Total Dose . . . . . 1×10^5 RAD (Si) R-Suffix
  1×10^6 RAD (Si) H-Suffix
- SEU. . . . . 1×10^{-9} Errors/Bit-Day

LINE TRANSMITTERS/RECEIVERS

Bipolar DI Process (HS-24XRH Series)

- Total Dose . . . . . 2×10^5 RAD (Si)
- Transient Upset . . . . . 1×10^9 RAD (Si)/s

AVLSI1R Process (HS-26C/T31/32 Series)

- Total Dose . . . . . 3×10^5 RAD (Si)
- Transient Upset . . . . . $>1 \times 10^9$ RAD (Si)/s

HCS/HCTS HIGH SPEED LOGIC

SOS Process

- Total Dose . . . . . 2×10^5 RAD (Si) R-Suffix
- SEU. . . . . $<2 \times 10^{-9}$ Errors/Bit-Day

SAMPLE AND HOLD

Bipolar DI Process

- Total Dose . . . . . 1×10^5 RAD (Si)
- Max Drift Current (Over Temp). 10nA

ACS/ACTS ADVANCED LOGIC

1.2µ SOS Process

- Total Dose . . . . . 3×10^5 RAD (Si) H-Suffix
- SEU. . . . . 1×10^{-10} Errors/Bit-Day

CONVERTERS

Bipolar DI Process

- Total Dose . . . . . $>0.5 \times 10^5$ RAD (Si)

AVLSIRA Process

- Total Dose . . . . . 3×10^5 RAD (Si)

MICROPROCESSORS - 80C85 FAMILY

SAJI - 4H Process

- Total Dose . . . . . 1×10^5 RAD (Si)
- Transient Upset. . . . . $>1 \times 10^8$ RAD (Si)/s
- Latch Up Free . . . . . $>1 \times 10^{12}$ RAD (Si)/s

See Section 1 for complete selection guide, page number reference, and file number listing.

PERIPHERALS - 80C85 FAMILY

SAJI - 4H Process

- Total Dose . . . . . 1×10^5 RAD (Si)
- Transient Upset . . . . . $>1 \times 10^8$ RAD (Si)/s
- SEU . . . . . 1×10^{-10} Errors/Bit-Day
- Latch Up Free . . . . . $>1 \times 10^{12}$ RAD (Si)/s

SRAMS

1.2µ SOS Process

- Organization 64K x 1 and 8K x 8
- Total Dose (8K x 8) . . . . . 3×10^5 RAD (Si)
- Transient Upset . . . . . 1×10^{11} RAD (Si)/s
- SEU . . . . . 1×10^{-12} Errors/Bit-Day

MICROPROCESSORS - 80C86 FAMILY

SAJI - 4H CMOS Process

- Total Dose . . . . . 1×10^5 RAD (Si)
- Transient Upset . . . . . $>1 \times 10^8$ RAD (Si)/s
- Latch Up Free EPI CMOS

PERIPHERALS - 80C86 FAMILY

SAJI - 4H CMOS Process

- Total Dose . . . . . 1×10^5 RAD (Si)
- Transient Upset . . . . . $>1 \times 10^8$ RAD (Si)/s
- Latch Up Free EPI CMOS

MICROCONTROLLER

1.2µ TSOS 4 CMOS/SOS Process

- Total Dose . . . . . 3×10^5 RAD (Si)

PROMS

SAJI - 4H Process

Organization 2K x 8 (HS-6617RH)

- Total Dose . . . . . 1×10^5 RAD (Si)
- Transient Upset . . . . . 1×10^{11} RAD (Si)/s
- LET . . . . . >50
- Latch Up Free . . . . . $>1 \times 10^{12}$ RAD (Si)/s

AVLSIR CMOS Process

Organization 8K x 8 (HS-6664RH)

- Total Dose . . . . . 3×10^5 RAD (Si)
- Transient Output Upset . . . . . 5×10^8 RAD (Si)/s
- LET . . . . . >100

DISCRETE DEVICES - POWER MOSFETs

- Total Dose . . . . . 10K, 100K, 1000K RAD (Si)
- Single Event Gate Rupture

Rad Hard Products Selection Guide

RAD HARD OPERATIONAL AMPLIFIERS

HS-3530RH LOW POWER OP AMP

Bipolar DI Process

- Neutron Fluence . . . . . $5 \times 10^{12} n/cm^2$ ($E \geq 10KeV$)
- Gamma Rate . . . . . 1×10^9 RAD (Si)/s
- Gamma Dose . . . . . 1×10^6 RAD (Si)
- Slew Rate . . . . . 0.06 to 3V/µs (Typ)
- Gain Bandwidth . . . . . 100kHz to 5MHz (Typ)
- I_{CC} . . . . . 10µA to 1.2mA

HS-2520RH UNCOMPENSATED HIGH SLEW RATE OPERATIONAL AMPLIFIER

DI Bipolar Process

- Total Dose . . . . . 1×10^4 RAD (Si)
- Fast Settling (0.2%) 200ns
- Low Offset Current 10nA
- High Slew Rate 120V/µs
- High Input Impedance 100MΩ

HS-2400RH PRAM FOUR CHANNEL OPERATIONAL AMPLIFIER

DI Bipolar Process

- Total Dose . . . . . 1×10^4 RAD (Si)
- Digital Programmability
- Low Offset Current 5nA
- High Slew Rate 30V/µs

HS-2600RH WIDEBAND, HIGH IMPEDANCE OPERATIONAL AMPLIFIER

DI Bipolar Process

- Total Dose . . . . . 1×10^4 RAD (Si)
- Wide Bandwidth 12MHz
- Low Input Offset Current 1nA
- High Gain 150KV/V
- High Input Impedance 500MΩ

HS-2510RH HIGH SLEW RATE OPERATIONAL AMPLIFIER

DI Bipolar Process

- Total Dose . . . . . 1×10^4 RAD (Si)
- Fast Settling (0.1%) 250ns
- Low Offset Current 10nA
- High Slew Rate 60V/µs

HS-2622RH VERY WIDEBAND, UNCOMPENSATED OPERATIONAL AMPLIFIER

DI Bipolar Process

- Total Dose . . . . . 1×10^4 RAD (Si)
- Gain Bandwidth Product ($A_V \geq 5$) 100MHz
- High Slew Rate 35V/µs
- High Input Impedance 500MΩ

RAD HARD SAMPLE AND HOLD

HS-2420RH FAST SAMPLE AND HOLD

DI Bipolar Process

- Total Dose . . . . . 1×10^5 RAD (Si)
- Max Acquisition Time
  - 10V Step to 0.1% 4µs
  - 10V Step to 0.01% 6µs
- Max Drift Current (Over Temp) 10nA
- Power Supply Rejection . . . . . ≥80dB

RAD HARD MULTIPLEXERS

HS-508ARH 8-CHANNEL MUX WITH OVERVOLTAGE PROTECTION

DI CMOS Process

- Gamma Rate . . . . . 1 x 10^8 RAD (Si)/s
- Gamma Dose. . . . . 1 x 10^5 RAD (Si)
- Break Before Make Access Time. . . . . 1µs (Max)
- R_{ON} . . . . . 1.8kΩ (Max)
- Off Isolation 45dB

HS-1840RH 16-CHANNEL MUX WITH HIGH-Z INPUT PROTECTION

DI CMOS Process

- Gamma Rate . . . . . 1 x 10^8 RAD (Si)/s
- Gamma Dose. . . . . 2 x 10^5 RAD (Si)
- Break Before Make Access Time. . . . . 1µs (Max)
- R_{ON} . . . . . 2kΩ at 15V Post RAD
- R_{ON} . . . . . 7.5kΩ at -5V Post RAD

HS-0546RH 16-CHANNEL SINGLE ANALOG MULTIPLEXER WITH ACTIVE OVERVOLTAGE PROTECTION

DI 44V CMOS Process

- Total Dose . . . . . 1 x 10^4 RAD (Si)
- Analog Signal Range . . . . . ±15V
- Max Input Voltage (P-P). . . . . 70V (P-P)
- Latch-Up Free
- Guaranteed R_{ON} Matching

HS-0547RH 8-CHANNEL DIFFERENTIAL ANALOG MULTIPLEXER WITH ACTIVE OVERVOLTAGE PROTECTION

DI 44V CMOS Process

- Total Dose . . . . . 1 x 10^4 RAD (Si)
- Analog Signal Range . . . . . ±15V
- Max Input Voltage (P-P). . . . . 70V (P-P)
- Latch-Up Free
- Guaranteed R_{ON} Matching

HS-0506RH 16-CHANNEL SINGLE ANALOG CMOS MULTIPLEXER

DI 44V CMOS Process

- Total Dose . . . . . 1 x 10^4 RAD (Si)
- Wide Analog Signal Range . . . . . ±15V
- Low On Resistance 180Ω
- Access Time 250ns
- 44V Maximum Supply
- Latch-Up Free

HS-0507RH 8-CHANNEL DIFFERENTIAL ANALOG CMOS MULTIPLEXER

DI 44V CMOS Process

- Total Dose . . . . . 1 x 10^4 RAD (Si)
- Wide Analog Signal Range . . . . . ±15V
- Low On Resistance 180Ω
- Access Time 250ns
- 44V Maximum Supply
- Latch-Up Free

HS-0508RH 8-CHANNEL SINGLE ANALOG CMOS MULTIPLEXER

DI 44V CMOS Process

- Total Dose . . . . . 1 x 10^4 RAD (Si)
- Wide Analog Signal Range . . . . . ±15V
- Low On Resistance 180Ω
- Access Time 250ns
- 44V Maximum Supply
- Latch-Up Free

HS-0509RH 4-CHANNEL DIFFERENTIAL ANALOG CMOS MULTIPLEXER

DI 44V CMOS Process

- Total Dose . . . . . 1 x 10^4 RAD (Si)
- Wide Analog Signal Range . . . . . ±15V
- Low On Resistance 180Ω
- Access Time 250ns
- 44V Maximum Supply
- Latch-Up Free

RAD HARD LINE TRANSMITTERS/RECEIVERS

HS-245RH TRIPLE LINE TRANSMITTER

Bipolar DI Process

- Total Dose . . . . . 2×10^5 RAD (Si)
- Transient Upset . . . . . 1×10^9 RAD (Si)/s
- Neutron Fluence . . . . . 5×10^{12} n/cm^2
- Speed 50 ft. Cable 15MHz
- Speed 1000 ft. Cable 2MHz

HS-246RH TRIPLE LINE RECEIVER

Bipolar DI Process

- Total Dose . . . . . 2×10^5 RAD (Si)
- Transient Upset . . . . . 1×10^9 RAD (Si)/s
- Neutron Fluence . . . . . 5×10^{12} n/cm^2
- Speed 50 ft. Cable 15MHz
- Speed 1000 ft. Cable 2MHz

HS-248RH TRIPLE PARTY-LINE RECEIVER

Bipolar DI Process

- Total Dose . . . . . 2×10^5 RAD (Si)
- Transient Upset . . . . . 1×10^9 RAD (Si)/s
- Neutron Fluence . . . . . 5×10^{12} n/cm^2
- Speed 50 ft. Cable 15MHz
- Speed 1000 ft. Cable 2MHz

HS-26C31RH RS422 CMOS LINE TRANSMITTER

AVLSI1R Process

- Total Dose . . . . . 3×10^5 RAD (Si)
- Transient Upset . . . . . $>1 \times 10^9$ RAD (Si)/s
- Latchup Free epi CMOS

HS-26C32RH RS422 CMOS LINE RECEIVER

AVLSI1R Process

- Total Dose . . . . . 3×10^5 RAD (Si)
- Transient Upset . . . . . $>1 \times 10^9$ RAD (Si)/s
- Latchup Free epi CMOS

HS-26CT31RH RS422 TTL LINE TRANSMITTER

AVLSI1R Process

- Total Dose . . . . . 3×10^5 RAD (Si)
- Transient Upset . . . . . $>1 \times 10^9$ RAD (Si)/s
- Latchup Free epi CMOS

HS-26CT32RH RS422 TTL LINE RECEIVER

AVLSI1R Process

- Total Dose . . . . . 3×10^5 RAD (Si)
- Transient Upset . . . . . $>1 \times 10^9$ RAD (Si)/s
- Latchup Free epi CMOS

RAD HARD CONVERTERS

HS-565ARH HIGH SPEED 12-BIT DIGITAL-TO-ANALOG CONVERTER

Bipolar DI Process

- Total Dose . . . . . .> 0.5 x 10^5 RAD (Si)
- Settles to 1/2 LSB in 500ns (Max)
- Low Gain Drift (Max, DAC + Reference) . . . . . 25ppm/°C

HS-9008RH CMOS 8-BIT FLASH ANALOG-TO-DIGITAL CONVERTER

AVLSIRA CMOS Process

- Total Dose . . . . . > 3 x 10^5 RAD (Si)
- Low Power . . . . . .400mW (Typ)
- Sampling Rate (50ns Conversion Time) 20MHz
- Linearity. . . . . 0.5 LSB (Typ)

RAD HARD SWITCHES

HS-302RH DUAL DPST

DICMOS Process

- Functional Total Dose . . . . . > 1 x 10^5 RAD (Si)
- R_{ON} Post RAD . . . . . 35Ω (Typ)
- Break Before Make Delay . . . . . 35ns (Typ)

HS-303RH, HS-307RH, HS-390RH DUAL SPDT

DICMOS Process

- Functional Total Dose . . . . . > 1 x 10^5 RAD (Si)
- R_{ON} Post RAD . . . . . 35Ω (Typ)
- Break Before Make Delay . . . . . .35ns (Typ)

RAD HARD LOGIC

ACS/ACTS ADVANCED LOGIC

1.2μ SOS Process

- Total Dose . . . . . 1 x 10^6 RAD (Si) H-Suffix
- SEU . . . . . <2 x 10^{-11} Errors/Bit-Day
- Latch-Up Free Under Any Condition
- Propagation Delay . . . . . 6ns to 11ns (Typ)

NOTE: 36 Device types available, refer to the following pages.

RAD HARD CD4000 LOGIC

Hardened Bulk CMOS Process

- Total Dose . . . . . 1 x 10^5 RAD (Si) R-Suffix
  . . . . . 1 x 10^6 RAD (Si) H-Suffix
- SEU. . . . . 1 x 10^{-9} Errors/Bit-Day
- Latch Up . . . . . >10^9 RAD (Si)/s
- Propagation Delay. . . . . 65ns to 200ns (Typ) (Depending on Type)

NOTE: 125 Device types available, refer to the following pages.

HCS/HCTS HIGH SPEED LOGIC

SOS Process

- Total Dose . . . . . .2 x 10^5 RAD (Si) R-Suffix
- SEU . . . . . .<2 x 10^{-9} Errors/Bit-Day
- Latch-Up Free Under Any Condition
- Propagation Delay . . . . . 15ns to 30ns (Typ) (Depending on Type)
- Dose Rate Upset . . . . . >10^{10} RAD (Si)/s, 20ns Pulse

NOTE: 41 HCS and 49 HCTS device types available, refer to the following pages.

RAD HARD CD4000 CMOS LOGIC

HARRIS DEVICE	DESCRIPTION
CD4000B	Dual 3-Input NOR Gate Plus Inverter
CD4001B	Quad 2-Input NOR Gate
CD4002B	Dual 4-Input NOR Gate
CD4006B	18-Stage Static Shift Register
CD4007UB	Dual Complementary Pair Plus Inverter
CD4008B	4-Bit Full Adder with Parallel Carry-Out
CD4009UB	Hex Buffer/Converter (Inverting)
CD4010B	Hex Buffer/Converter (Non-Inverting)
CD4011B	Quad 2-Input NAND Gate
CD4012B	Dual 4-Input NAND Gate
CD4013B	Dual D Flip-Flop with Set/Reset Capability
CD4014B	8-Stage Static Shift Register
CD4015B	Dual 4-Stage Static Shift Register
CD4016B	Quad Bilateral Switch
CD4017B	Decade Counter/Divider
CD4018B	Presettable Divide-By N Counter
CD4019B	Quad AND/OR Select Gate
CD4020B	14-Stage Binary Ripple Counter
CD4021B	8-Stage Static Shift Register
CD4022B	Divide-By-8 Counter/Divider
CD4023B	Triple 3-Input NAND Gate
CD4024B	7-Stage Binary Ripple Counter
CD4025B	Triple 3-Input NOR Gate
CD4027B	Dual J-K Flip-Flop with Set/Reset Capability
CD4028B	BCD-to-Decimal Decoder
CD4029B	Presettable Up/Down Counter
CD4030B	Quad Exclusive-OR Gate
CD4031B	64-Stage Static Shift Register
CD4033B	Decade Counter/Divider
CD4034B	8-Stage Static Shift Register
CD4035B	4-Stage Parallel-In/Parallel-Out Shift Register
CD4040B	12-Stage Binary Ripple Counter
CD4041UB	Quad True/Complement Buffer
CD4042B	Quad Clocked D Latch

HARRIS DEVICE	DESCRIPTION
CD4043B	Quad NOR R/S Latch (Three-State Outputs)
CD4044B	Quad NAND R/S Latch (Three-State Outputs)
CD4046B	Micropower Phase-Locked Loop
CD4047B	Monostable/Astable Multivibrator
CD4048B	Multifunctional Expandable 8-Input Gate (Three-State Outputs)
CD4049UB	Hex Buffer/Converter (Inverting)
CD4050B	Hex Buffer/Converter (Non-Inverting)
CD4051B	8-Channel Analog MUX/DeMUX
CD4052B	4-Channel Analog MUX/DeMUX
CD4053B	Analog MUX/DeMUX - Triple 2-Channel
CD4060B	14-Stage Binary Ripple Counter/Divider and Oscillator
CD4063B	4-Bit Magnitude Comparator
CD4066B	Quad Bilateral Switch
CD4067B	16-Channel Analog MUXs/DeMUXs
CD4068B	8-Input NAND/AND Gate
CD4069UB	Hex Inverter
CD4070B	Quad Exclusive-OR Gate
CD4071B	Quad 2-Input OR Gate
CD4072B	Dual 4-Input OR Gate
CD4073B	Triple 3-Input AND Gate
CD4075B	Triple 3-Input OR Gate
CD4076B	4-Bit D Flip-Flop (Three-State Outputs)
CD4077B	Quad Exclusive-NOR Gate
CD4078B	8-Bit NOR/OR Gate
CD4081B	Quad 2-Input AND Gate
CD4082B	Dual 4-Input AND Gate
CD4085B	Dual 2-Wide, 2-Input AND/OR/Invert (AOI) Gate
CD4086B	Expandable 4-Wide, 2-Input AND/OR/Invert (AOI) Gate
CD4089B	Binary Rate Multiplier
CD4093B	Quad 2-Input NAND Schmitt Trigger
CD4094B	8-Stage Shift-and-Store Bus Register
CD4095B	Gated J-K Flip-Flop (Non-Inverting)
CD4096B	Gated J-K Flip-Flop (Inverting) and (Non-Inverting)

9 MILITARY GRADE/ HIGH-RELIABILITY

See Section 1 for complete selection guide, page number reference, and file number listing.

RAD HARD CD4000 CMOS LOGIC (Continued)

HARRIS DEVICE	DESCRIPTION
CD4097B	8-Channel Analog MUX/DeMUX
CD4098B	Dual Monostable Multivibrator
CD4099B	8-Bit Addressable Latch
CD4502B	Strobed Hex Inverter/Buffer
CD4503B	Hex Buffer (Non-Inverting)
CD4504B	Hex Voltage-Level Shifter for TTL-to-CMOS or CMOS-to-CMOS Operation
CD4508B	Dual 4-Bit Latch
CD4510B	Presettable 4-Bit BCD Up/Down Counter
CD4511B	BCD-to-7-Segment Latch Decoder/Driver
CD4512B	8-Channel Data Selector (Three-State Output)
CD4514B	4-Bit Latch/4-to-16-Line Decoder (Outputs Low)
CD4515B	4-Bit Latch/4-to-16-Line Decoder (Outputs Low)
CD4516B	Presettable 4-Bit Binary Up/Down Counter
CD4517B	Dual 64-Bit Shift Register
CD4518B	Dual BCD Up Counter
CD4520B	Dual Binary Up Counter
CD4527B	BCD Rate Multiplier
CD4532B	8-Input Priority Encoder
CD4536B	Programmable Timer
CD4555B	Dual 1-to-4 Decoder/DeMUX (Outputs High)
CD4556B	Dual Binary to 1 of 4 Decoder/DeMUX (Outputs Low)
CD4585B	4-Bit Magnitude Comparator
CD4724B	8-Bit Addressable Latch
CD14538B	Dual Precision Monostable Multivibrator
CD40100B	9-Bit Parity Generator/Checker
CD40101B	9-Bit Parity Generator/Checker

HARRIS DEVICE	DESCRIPTION
CD40102B	Presettable 2-Decade BCD Down Counter
CD40103B	Presettable 8-Bit Binary Down Counter
CD40104B	4-Bit Bidirectional Universal Shift Register
CD40105B	4-Bit x 16 Word FIFO Buffer Register
CD40106B	Hex Schmitt Trigger
CD40107B	Dual 2-Input NAND Buffer/Driver
CD40108B	4 x 4 Multiport Register
CD40109B	Quad Low-to-High Voltage Interface
CD40110B	Decade Up/Down Counter/Decoder/Latch Display Driver
CD40147B	10-Line to 4-Line BCD Priority Encoder
CD40160B	Synchronous Programmable 4-Bit Counter Decade with Asychronous Clear
CD40161B	4-Bit Binary Counter with Asynchronous Clear
CD40162B	Synchronous Programmable 4-Bit Counter Decade with Synchronous Clear
CD40163B	Synchronous Programmable 4-Bit Counter Binary with Synchronous Clear
CD40174B	Synchronous Programmable 4-Bit Counter Binary with Synchronous Clear
CD40175B	Quad D Type Flip-Flop
CD40181B	CMOS 4-Bit Arithmetic Logic Unit
CD40182B	CMOS Look-Ahead Carry Generator
CD40192B	CMOS Look-Ahead Carry Generator
CD40193B	CMOS Presettable Up/Down Counter (Dual Clock with Reset)
CD40194B	4-Bit Bidirectional Universal Shift Register
CD40208B	4 x 4 Multiport Register
CD40257B	Quad 2-Line-to-1-Line Data Selector/MUX

See Section 1 for complete selection guide, page number reference, and file number listing.

RAD HARD HCS/HCTS HIGH SPEED LOGIC

HARRIS DEVICE	DESCRIPTION
HCS00	CMOS Compatible Quad 2-Input NAND Gate
HCTS00	TTL Compatible Quad 2-Input NAND Gate
HCS02	CMOS Compatible Quad 2-Input NOR Gate
HCTS02	TTL Compatible Quad 2-Input NOR Gate
HCS04	CMOS Compatible Hex Inverter Gate
HCTS04	TTL Compatible Hex Inverter Gate
HCS05	CMOS Compatible Hex Converter, Open Drain Outputs
HCS08	CMOS Compatible Quad 2-Input AND Gate
HCTS08	TTL Compatible Quad 2-Input AND Gate
HCS10	CMOS Compatible Triple 3-Input NAND Gate
HCTS10	TTL Compatible Triple 3-Input NAND Gate
HCS11	CMOS Compatible Triple 3-Input AND Gate
HCTS11	TTL Compatible Triple 3-Input AND Gate
HCS14	CMOS Compatible Hex Inverter Schmitt Trigger
HCTS14	TTL Compatible Hex Inverter Schmitt Trigger Gate
HCS20	CMOS Compatible Dual 4-Input NAND Gate
HCTS20	TTL Compatible Dual 4-Input NAND Gate
HCS21	CMOS Compatible Dual 4-Input AND Gate
HCTS21	TTL Compatible Dual 4-Input AND Gate
HCS27	CMOS Compatible Triple 3-Input NOR Gate
HCTS27	TTL Compatible Triple 3-Input NOR Gate
HCTS30	TTL Compatible 8-Input NAND Gate
HCS32	CMOS Compatible Quad 2-Input OR Gate
HCTS32	TTL Compatible Quad 2-Input OR Gate
HCS74	CMOS Compatible Dual-D Flip-Flop with Set and Reset, Positive Edge Trigger
HCTS74	TTL Compatible Dual-D Flip-Flop with Set and Reset, Positive Edge Trigger
HCTS75	TTL Compatible Dual 2-Bit Bistable Transparent Latch
HCTS85	TTL Compatible 4-Bit Magnitude Comparator
HCS86	CMOS Compatible Quad 2-Input Exclusive-OR Gate

HARRIS DEVICE	DESCRIPTION
HCTS86	CMOS Compatible Quad 2-Input Exclusive-OR Gate
HCTS93	TTL Compatible 4-Bit Binary Ripple Counter
HCS109	CMOS Compatible Dual J-K Flip-Flop with Set and Reset, Positive Edge Trigger
HCTS109	TTL Compatible Dual J-K Flip-Flop with Set and Reset, Positive Edge Trigger
HCS112	CMOS Compatible Dual J-K Flip-Flop with Set and Reset Negative Edge Trigger
HCTS112	TTL Compatible Dual J-K Flip-Flop with Set and Reset, Negative Edge Trigger
HCS125	CMOS Compatible Quad Buffer, Three-State
HCS132	CMOS Compatible Quad 2-Input NAND Schmitt Trigger
HCTS132	TTL Compatible Quad 2-Input NAND Schmitt Trigger
HCS138	CMOS Compatible Inverting 3-to-8 Line Decoder/Demultiplexer
HCTS138	CMOS Compatible Inverting 3-to-8 Line Decoder/Demultiplexer
HCS139	CMOS Compatible Dual 2-to-4 Line Decoder/Demultiplexer
HCTS139	TTL Compatible Dual 2-to-4 Line Decoder/DeMUX
HCTS147	TTL Compatible 10-to-4 Line Priority Decoder
HCS151	CMOS Compatible 8-Input MUX
HCTS153	TTL Compatible Dual 4-Input MUX
HCS154	CMOS Compatible 4-to-6 Line Decoder/DeMUX
HCS157	CMOS Compatible Quad 2-Input MUX
HCTS157	TTL Compatible Quad 2-Input MUX
HCS160	CMOS Compatible Synchronous Counter BCD Decade Counter, Asychronous Reset
HCTS160	TTL Compatible Synchronous Counter BCD Decade Counter, Asynchronous Reset
HCS161	CMOS Compatible Presettable Counter 4-Bit Binary Counter, Asychronous Reset
HCTS161A	TTL Compatible Presettable Counter 4-Bit Binary Counter, Asychronous Reset
HCS163	CMOS Compatible Synchronous Presettable Counter

See Section 1 for complete selection guide, page number reference, and file number listing.

RAD HARD HCS/HCTS HIGH SPEED LOGIC (Continued)

HARRIS DEVICE	DESCRIPTION
HCTS163	TTL Compatible Synchronous Presettable Counter
HCS164	CMOS Compatible 8-Bit Serial-In/Parallel-Out Shift Register
HCTS164	TTL Compatible 8-Bit Serial-In/Parallel-Out Shift Register
HCS165	CMOS Compatible 8-Bit Parallel-In/Serial-Out Shift Register
HCS166	CMOS Compatible 8-Bit Parallel-In/Serial-Out Shift Register
HCS190	CMOS Compatible Synchronous Presettable Up/Down BCD Decade Counter, Asynchronous Reset
HCTS190	TTL Compatible Synchronous Presettable Up/Down BCD Decade Counter, Asynchronous Reset
HCTS191	TTL Compatible Synchronous Counter Presettable Up/Down 4-Bit Counter, Asynchronous Reset
HCS193	CMOS Compatible Synchronous 4-Bit Binary Up/Down Counter
HCTS193	TTL Compatible Synchronous 4-Bit Binary Up/Down Counter
HCS195	CMOS Compatible Dual 4-Bit Parallel Access Register
HCS240	CMOS Compatible Octal Buffer/Line Driver, Three-State
HCTS240A	TTL Compatible Octal Buffer/Line Driver, Three-State
HCS241	CMOS Compatible Octal Buffer/Line Driver, Three-State
HCS244	CMOS Compatible Octal Buffer/Line Driver, Three-State
HCTS244	TTL Compatible Octal Buffer/Line Driver, Three-State
HCS245	CMOS Compatible Octal Transceiver
HCTS245	TTL Compatible Octal Transceiver
HCS253	CMOS Compatible Dual 4-Input MUX, Three-State

HARRIS DEVICE	DESCRIPTION
HCS273	CMOS Compatible Octal D Flip-Flop with Master Reset
HCTS273	TTL Compatible Octal D Flip-Flop with Master Reset
HCS283	CMOS Compatible 4-Bit Full Adder
HCTS283	CMOS Compatible 4-Bit Full Adder
HCTS299	TTL Compatible 8-Bit Universal Shift Register, Three-State
HCTS365	TTL Compatible Hex Buffer/Line Driver, Three-State
HCS373	CMOS Compatible Octal Transparent Latch, Three-State
HCTS373	TTL Compatible Octal Transparent Latch, Three-State
HCS374	CMOS Compatible Octal D-Type Flip-Flop Positive Edge Trigger, Three-State
HCTS374	TTL Compatible Octal D-Type Flip-Flop Positive Edge Trigger, Three-State
HCTS390	TTL Compatible Dual Decade Ripple Counter
HCTS393	TTL Compatible Dual 4-State Binary Counter
HCTS540	TTL Compatible Inverting Octal Buffer/Line Driver, Three-State
HCS541	CMOS Compatible Octal Buffer/Line Driver, Three-State
HCTS541	TTL Compatible Octal Buffer/Line Driver, Three-State
HCS573	CMOS Compatible Octal Transparent Latch Three-State Output
HCTS574	TTL Compatible Octal D-Type Flip-Flop, Positive Edge Trigger, Three-State
HCTS646	TTL Compatible Octal Bus Transceiver/Register, Three-State
HCTS4002	TTL Compatible Dual 4-Input NOR Gate
HCTS7266	TTL Compatible Quad 2-Input Exclusive-OR Gate

See Section 1 for complete selection guide, page number reference, and file number listing.

RAD HARD ACS/ACTS ADVANCED LOGIC

HARRIS DEVICE	DESCRIPTION
ACS00	CMOS Compatible Quad 2-Input NAND Gate
ACTS00	TTL Compatible Quad 2-Input NAND Gate
ACS03	CMOS Compatible Hex Inverter Open Drain
ACTS04	TTL Compatible Hex Inverter
ACS08	CMOS Compatible Quad 2-Input AND Gate
ACTS08	TTL Compatible Quad 2-Input AND Gate
ACS10	CMOS Compatible Triple 3-Input NAND Gate
ACTS10	TTL Compatible Triple 3-Input NAND Gate
ACS20	CMOS Compatible Dual 4-Input NAND Gate
ACTS20	TTL Compatible Dual 4-Input NAND Gate
ACS74	CMOS Compatible D Flip-Flop with Set and Reset
ACTS74	TTL Compatible D Flip-Flop with Set and Reset
ACS86	CMOS Compatible Quad 2-Input Exclusive-OR Gate
ACTS86	TTL Compatible Quad 2-Input Exclusive-OR Gate
ACS112	CMOS Compatible J-K Flip-Flop with Set and Reset
ACTS112	TTL Compatible J-K Flip-Flop with Set and Reset
ACS125	CMOS Compatible Quad Buffer, Three-State
ACTS125	TTL Compatible Quad Buffer, Three-State
ACS161	CMOS Compatible 4-Bit Synchronous Counter
ACTS161	TTL Compatible 4-Bit Synchronous Counter
ACTS240	TTL Compatible Octal Buffer/Line Driver Three-State, Inverting

HARRIS DEVICE	DESCRIPTION
ACTS244	TTL Compatible Octal Buffer/Line Driver Three-State
ACS245	CMOS Compatible Octal Bus Transceiver Three-State
ACTS245	TTL Compatible Octal Bus Transceiver Three-State
ACS280	CMOS Compatible 9-Bit Odd/Even Parity Generator/Checker
ACTS280	TTL Compatible 9-Bit Odd/Even Parity Generator/Checker
ACS373	CMOS Compatible Octal Transparent Latch Three-State
ACTS373	TTL Compatible Octal Transparent Latch Three-State
ACS374	CMOS Compatible Octal D Flip-Flop Three-State
ACTS374	TTL Compatible Octal D Flip-Flop Three-State
ACS521	CMOS Compatible 8-Bit Magnitude Comparator
ACS541	CMOS Compatible Octal Buffer/Line Driver Three-State
ACTS541	TTL Compatible Octal Buffer/Line Driver Three-State
ACS573	CMOS Compatible Octal Transparent Latch Three-State
ACTS573	TTL Compatible Octal Transparent Latch Three-State
ACS630	CMOS Compatible Error Detection and Correction
ACTS630	TTL Compatible Error Detection and Correction

See Section 1 for complete selection guide, page number reference, and file number listing.

RAD HARD MICROPROCESSORS AND PERIPHERALS

HARRIS DEVICE	DESCRIPTION	PROCESS
HS-80C85RH	Static 8-Bit CMOS Microprocessor	SAJI-4H
HS-80C86RH	Static 16-Bit CMOS Microprocessor	SAJI-4H
HS-3374RH	8-Bit Bidirectional Level Converter	SAJI-4H
HS-54C138RH	3-Line to 8-Line Decoder	SAJI-4H
HS-81C55RH	256 x 8 CMOS RAM, 22-Bit I/O, Timer	SAJI-4H
HS-81C56RH	256 x 8 CMOS RAM	SAJI-4H
HS-82C08RH	8-Bit Bus Transceiver	SAJI-4H
HS-82C12RH	8-Bit I/O Port	SAJI-4H
HS-82C37ARH	DMA Controller	SAJI-4H
HS-82C54RH	16-Bit Timer/Counter	SAJI-4H
HS-82C55ARH	Programmable 24-Bit Parallel I/O	SAJI-4H
HS-82C85RH	CMOS Controller/Generator	SAJI-4H

Total Dose . . . . . 1×10^5 RAD (Si)

RAD HARD MICROCONTROLLER

HARRIS DEVICE	DESCRIPTION	PROCESS
HS-RTX2010RH	16-Bit Microcontroller	1.2μ CMOS/SOS

Total Dose . . . . . 3×10^5 RAD (Si)
SEU . . . . . $<1 \times 10^{-10}$ Errors/Bit-Day
8 MIPS Throughput
Latch Up Immune SOS Processing

RAD HARD MEMORIES

HARRIS DEVICE	SIZE	ACCESS TIME	ICCSB	ICCOP	PROCESS
HS-6617RH (Note 1)	2K x 8	100ns	550μW	137.5mW/MHz	SAJI-4H
HS-6664RH (Note 1)	8K x 8	60ns	2.7μW	80mW/MHz	AVLSIR
HS-65643RH	64K x 1	50ns	10mW	15mW/MHz	TSOS-4
HS-65647RH	8K x 8	50ns	10mW	15mW/MHz	TSOS-4

SAJI - 4H Process

Total Dose . . . . . 1×10^5 RAD (Si)
Data Upset. . . . . $>1 \times 10^8$ RAD (Si)/s
Latch Up Free . . . . . $>1 \times 10^{12}$ RAD (Si)/s

1.2μ Process

Total Dose . . . . . 3×10^5 RAD (Si)
Transient Upset. . . . . 1×10^{11} RAD (Si)/s
SEU. . . . . 1×10^{-12} Errors/Bit-Day
Latch Up Immune

NOTE:
1. PROM

See Section 1 for complete selection guide, page number reference, and file number listing.

Tactical and Strategic Level Selections (Note 1)

RADIATION HARDENED MOSFETS (N-CHANNEL)

DIE FAMILY	TO-3		TO-39		TO-254		TO-257		TO-258	
	INTERIM	FINAL	INTERIM	FINAL	INTERIM	FINAL	INTERIM	FINAL	INTERIM	FINAL
17631	FRM130D	2N7271	FRL130D	2N7272	-	-	FRS130D	2N7273	-	-
	FRM130R		FRL130R		-	-	FRS130R		-	-
	FRM130H		FRL130H		-	-	FRS130H		-	-
17632	FRM230D	2N7274	FRL230D	2N7275	-	-	FRS230D	2N7276	-	-
	FRM230R		FRL230R		-	-	FRS230R		-	-
	FRM230H		FRL230H		-	-	FRS230H		-	-
17633	FRM234D	2N7277	FRL234D	2N7278	-	-	FRS234D	2N7279	-	-
	FRM234R		FRL234R		-	-	FRS234R		-	-
	FRM234H		FRL234H		-	-	FRS234H		-	-
17635	FRM430D	2N7280	FRL430D	2N7281	-	-	FRS430D	2N7282	-	-
	FRM430R		FRL430R		-	-	FRS430R		-	-
	FRM430H		FRL430H		-	-	FRS430H		-	-
17641	FRM140D	2N7283	-	-	-	-	FRS140D	2N7284	-	-
	FRM140R		-	-	-	-	FRS140R		-	-
	FRM140H		-	-	-	-	FRS140H		-	-
17642	FRM240D	2N7285	-	-	-	-	FRS240D	2N7286	-	-
	FRM240R		-	-	-	-	FRS240R		-	-
	FRM240H		-	-	-	-	FRS240H		-	-
17643	FRM244D	2N7287	-	-	-	-	FRS244D	2N7288	-	-
	FRM244R		-	-	-	-	FRS244R		-	-
	FRM244H		-	-	-	-	FRS244H		-	-
17645	FRM440D	2N7289	-	-	-	-	FRS440D	2N7290	-	-
	FRM440R		-	-	-	-	FRS440R		-	-
	FRM440H		-	-	-	-	FRS440H		-	-
17651	FRK150D	2N7291	-	-	FRF150D	2N7292	-	-	-	-
	FRK150R		-	-	FRF150R		-	-	-	-
	FRK150H		-	-	FRF150H		-	-	-	-

RADIATION HARDENED MOSFETS (N-CHANNEL) (Continued)

DIE FAMILY	TO-3		TO-39		TO-254		TO-257		TO-258	
	INTERIM	FINAL	INTERIM	FINAL	INTERIM	FINAL	INTERIM	FINAL	INTERIM	FINAL
17652	FRK250D	2N7293	-	-	FRF250D	2N7294	-	-	-	-
	FRK250R		-	-	FRF250R		-	-	-	-
	FRK250H		-	-	FRF250H		-	-	-	-
17653	FRK254D	2N7295	-	-	FRF254D	2N7296	-	-	-	-
	FRK254R		-	-	FRF254R		-	-	-	-
	FRK254H		-	-	FRF254H		-	-	-	-
17655	FRM450D	2N7297	-	-	FRF450D	2N7298	-	-	-	-
	FRM450R		-	-	FRF450R		-	-	-	-
	FRM450H		-	-	FRF450H		-	-	-	-
17661	FRK160D	2N7299	-	-	-	-	-	-	FRE160D	2N7300
	FRK160R		-	-	-	-	-	-	FRE160R	
	FRK160H		-	-	-	-	-	-	FRE160H	
17662	FRK260D	2N7301	-	-	-	-	-	-	FRE260D	2N7302
	FRK260R		-	-	-	-	-	-	FRE260R	
	FRK260H		-	-	-	-	-	-	FRE260H	
17663	FRK264D	2N7303	-	-	-	-	-	-	FRE264D	2N7304
	FRK264R		-	-	-	-	-	-	FRE264R	
	FRK264H		-	-	-	-	-	-	FRE264H	
17665	FRK460D	2N7305	-	-	-	-	-	-	FRE460D	2N7306
	FRK460R		-	-	-	-	-	-	FRE460R	
	FRK460H		-	-	-	-	-	-	FRE460H	

NOTE: The reliability screening code has been omitted for convenience.

RAD HARD MOSFETs (P-CHANNEL)

DIE FAMILY	TO-3		TO-39		TO-254		TO-257		TO-258	
	INTERIM	FINAL	INTERIM	FINAL	INTERIM	FINAL	INTERIM	FINAL	INTERIM	FINAL
17731	FRM9130D	2N7307	FRL9130D	2N7308	-	-	FRS9130D	2N7309	-	-
	FRM9130R		FRL9130R		-		FRS9130R		-	
	FRM9130H		FRL9130H		-		FRS9130H		-	
17732	FRM9230D	2N7310	FRL9230D	2N7311	-	-	FRS9230D	2N7312	-	-
	FRM9230R		FRL9230R		-		FRS9230R		-	
	FRM9230H		FRL9230H		-		FRS9230H		-	
17741	FRM9140D	2N7316	-	-	-	-	FRS9140D	2N7317	-	-
	FRM9140R		-		-		FRS9140R		-	
	FRM9140H		-		-		FRS9140H		-	
17742	FRM9240D	2N7318	-	-	-	-	FRS9240D	2N7319	-	-
	FRM9240R		-		-		FRS9240R		-	
	FRM9240H		-		-		FRS9240H		-	
17751	FRK9150D	2N7322	-	-	FRF9150D	2N7323	-	-	-	-
	FRK9150R		-		FRF9150R		-		-	
	FRK9150H		-		FRF9150H		-		-	
17752	FRM9250D	2N7324	-	-	FRF9250D	2N7325	-	-	-	-
	FRM9250R		-		FRF9250R		-		-	
	FRM9250H		-		FRF9250H		-		-	
17761	FRK9160D	2N7328	-	-	-	-	-	-	FRE9160D	2N7329
	FRK9160R		-		-		-		FRE9160R	
	FRK9160H		-		-		-		FRE9160H	
17762	FRK9260D	2N7330	-	-	-	-	-	-	FRE9260D	2N7331
	FRK9260R		-		-		-		FRE9260R	
	FRK9260H		-		-		-		FRE9260H	

NOTE:

1. The reliability screening code has been omitted for convenience.

High-Reliability/Military and Rad Hard Cross Reference Part Number Listing Information

The cross-reference listing on the following pages, in Harris marketing/order entry part number sequence, contains all line items of the standard High-Reliability/Military (-55°C to +125°C temperature range) and Rad Hard products offered by Harris Semiconductor. The contents of this listing are described below.

Column 1. Compliant/Non-Compliant

C = Compliant

The Harris product in column two is fully compliant to the appropriate military specifications.

N = Non-Compliant

The Harris product in column two is non-compliant to appropriate military specifications, for some reason. The product is processed to "equivalent" flows and is tested and/or guaranteed for -55°C to +125°C temperature range operation.

These products normally do not automatically receive QCI Groups B, C, and/or D testing, and Generic Data may not be maintained.

Column 2. Harris Marketing/Order Entry Part Number

This entire list is in sequence by this number. All part numbers listed are Harris Semiconductor marketing and order entry part numbers assigned to sell a compliant or non-compliant military temperature range part. Occasionally a base/generic Harris part number is entered to cross-reference a QML-JAN or QML-DESC/SMD part number given in the next column.

The break-down of these marketing part numbers can be obtained by using the nomenclature guides located in the ordering information pages of this section.

Column 3. Reference Number

This number cross-references the Harris part number in Column 2 to another version/offering of this device type. The referenced number may, or may not be identical (electrical limits, testing, processing) to the Column 2 part number. However, a review of the specific data sheets and processing flows will allow necessary comparison.

QML-JAN and QML-DESC/SMD part numbers are crossed to Harris generic part numbers, and Harris part numbers are crossed to QML-JAN and QML-DESC/SMD part numbers. Also, non-compliant part numbers will be crossed to a compliant version, where one is available.

Column 4. Description

This column provides a very basic description of the part number given in Column 2.

Column 5. Data Sheet Reference

This column provides the data sheet file number for the marketing part number given in column two; also known as AnswerFAX document number. See Section 10 for AnswerFAX procedures and availability. JAN, SMD and DESC data sheets must be obtained from DESC.

NOTE: Datasheets for parts referencing JM38510 or Standard Microcircuit Drawing (SMD) can be ordered through DESC.

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	24501BVA	HM1-6504	RAM, Synchronous, 4K x 1, JAN (JM38510)	-
C	24502BVA	HM1-6514	RAM, Synchronous, 4K x 1, JAN (JM38510)	-
C	29102BJA	HM1-6516	RAM, Synchronous, 2K x 8, JAN (JM38510)	-
C	29103BRA	HM1-65262	RAM, Asynchronous, 16K x 1, JAN (JM38510)	-
C	29103BXA	HM4-65262	RAM, Asynchronous, 16K x 1, JAN (JM38510)	-
C	29104BJA	HM1-65162	RAM, Asynchronous, 2K x 8, JAN (JM38510)	-
C	29109BRA	HM1-65262B	RAM, Asynchronous, 16K x 1, JAN (JM38510)	-
C	29110BJA	HM1-65162B	RAM, Asynchronous, 2K x 8, JAN (JM38510)	-
C	29205BXA	HM1-65642B	RAM, Asynchronous, 8K x 8, JAN (JM38510)	-
C	2N6756TX	MIL-S-19500/542A	Power JANTX MOSFET 14.0A, 100V N-Channel TO-3	1586
C	2N6756TXV	MIL-S-19500/542A	Power JANTXV MOSFET 14.0A, 100V N-Channel	1586
C	2N6758TX	MIL-S-19500/542A	Power JANTX MOSFET 9.0A, 200V N-Channel	1587
C	2N6758TXV	MIL-S-19500/542A	Power JANTXV MOSFET 9.0A, 200V N-Channel	1587
C	2N6760TX	MIL-S-19500/542A	Power JANTX MOSFET 5A, 400V N-Channel	1588
C	2N6760TXV	MIL-S-19500/542A	Power JANTXV MOSFET 5A, 400V N-Channel	1588
C	2N6762TX	MIL-S-19500/542A	Power JANTX MOSFET 4A, 500V N-Channel	1589
C	2N6762TXV	MIL-S-19500/542A	Power JANTXV MOSFET 4A, 500V N-Channel	1589
C	2N6764TX	MIL-S-19500/543A	Power JANTX MOSFET 38A, 100V N-Channel	1590
C	2N6764TXV	MIL-S-19500/543A	Power JANTXV MOSFET 38A, 100V N-Channel	1590
C	2N6766TX	MIL-S-19500/543A	Power JANTX MOSFET 30A, 200V N -Channel	1591
C	2N6766TXV	MIL-S-19500/543A	Power JANTXV MOSFET 30A, 200V N-Channel	1591
C	2N6768TX	MIL-S-19500/543A	Power JANTX MOSFET 14A, 400V N-Channel	1898
C	2N6768TXV	MIL-S-19500/543A	Power JANTXV MOSFET 14A, 400V N-Channel	1898
C	2N6770TX	MIL-S-19500/543A	Power JANTX MOSFET 12A, 500V N-Channel	1899
C	2N6770TXV	MIL-S-19500/543A	Power JANTXV MOSFET 12A, 500V N-Channel	1899
C	2N6782TX	MIL-S-19500/556	Power JANTX MOSFET 3A, 100V N-Channel	1592
C	2N6782TXV	MIL-S-19500/556	Power JANTX V MOSFET 3A, 100V N-Channel	1592
C	2N6784TX	MIL-S-19500/556	Power JANTX MOSFET 25A, 200V N-Channel	1906
C	2N6784TXV	MIL-S-19500/556	Power JANTXV MOSFET 25A, 200V N-Channel	1906
C	2N6786TX	MIL-S-19500/556	Power JANTX MOSFET 15A, 400V N-Channel	2207
C	2N6786TXV	MIL-S-19500/556	Power JANTXV MOSFET 15A, 400V N-Channel	2207
C	2N6788TX	MIL-S-19500/555	Power JANTX MOSFET 6.0A, 100V N-Channel	1593
C	2N6788TXV	MIL-S-19500/555	Power JANTXV MOSFET 6.0A, 100V N-Channel	1593
C	2N6790TX	MIL-S-19500/555	Power JANTX MOSFET 3A, 200V N-Channel	1900
C	2N6790TXV	MIL-S-19500/555	Power JANTXV MOSFET 3A, 200V N-Channel	1900
C	2N6792TX	MIL-S-19500/555	Power JANTX MOSFET 2A, 400V N-Channel	1901
C	2N6792TXV	MIL-S-19500/555	Power JANTXV MOSFET 2A, 400V N-Channel	1901
C	2N6794TX	MIL-S-19500/555	Power JANTX MOSFET 1A, 500V N-Channel	1902
C	2N6794TXV	MIL-S-19500/555	Power JANTXV MOSFET 1A, 500V N-Channel	1902
C	2N6796TX	MIL-S-19500/557	Power JANTX MOSFET 8.0A, 100V N-Channel	1594
C	2N6796TXV	MIL-S-19500/557	Power JANTXV MOSFET 8.0A, 10V N-Channel	1594
C	2N6798TX	MIL-S-19500/557	Power JANTX MOSFET 5A, 200V N-Channel	1903
C	2N6798TXV	MIL-S-19500/557	Power JANTXV MOSFET 5A, 200V N-Channel	1903
C	2N6800TX	MIL-S-19500/557	Power JANTX MOSFET 3A, 400V N-Channel	1904
C	2N6800TXV	MIL-S-19500/557	Power JANTXV MOSFET 3A, 400V N-Channel	1904
C	2N6802TX	MIL-S-19500/557	Power JANTX MOSFET 2A, 500V N-Channel	1905
C	2N6802TXV	MIL-S-19500/557	Power JANTXV MOSFET 2.5A, 500V, N-Channel, TO-205AF	-
C	2N6849TX	MIL-S-19500/564	Power JANTX MOSFET 6A, 100V, P-Channel	2219

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	2N6849TXV	MIL-S-19500/564	Power JANTXV MOSFET 6A, 100V, P-Channel	2219
C	2N6851TX	MIL-S-19500/563	Power JANTX MOSFET 4A, 200V P-Channel	2218
C	2N6851TXV	MIL-S-19500/563	Power JANTX MOSFET 4A, 200V P-Channel	2218
C	2N6895TX	MIL-S-19500/565	Power JANTX MOSFET 16A, 100V P-Channel	1873
C	2N6895TXV	MIL-S-19500/565	Power JANTX MOSFET 16A, 100V P-Channel	1873
C	2N6896TX	MIL-S-19500/565	Power JANTX MOSFET 6A, 100V P-Channel	1874
C	2N6896TXV	MIL-S-19500/565	Power JANTXV MOSFET 6A, 100V P-Channel	1874
C	2N6897TX	MIL-S-19500/565	Power JANTX MOSFET 12A, 30W, 100W P-Channel	1875
C	2N6897TXV	MIL-S-19500/565	Power JANTXV MOSFET 12A, 100V P-Channel	1875
C	2N6898TX	MIL-S-19500/565	Power JANTX MOSFET 25A, 100V P-Channel	1876
C	2N6898TXV	MIL-S-19500/565	Power JANTXV MOSFET 25A, 100V P-Channel	1876
C	2N6901TX	MIL-S-19500/566	Power JANTX MOSFET Logic-Level FET 1.69A	1877
C	2N6901TXV	MIL-S-19500/566	Power JANTXV MOSFET Logic-Level FET 1.69A	1877
C	2N6902TX	MIL-S-19500/566	Power JANTX MOSFET Logic-Level FET 12A, 100V N-Channel	1878
C	2N6902TXV	MIL-S-19500/566	Power JANTXV MOSFET Logic-Level FET 12A, 100V, N-Channel	1878
C	2N6903TX	MIL-S-19500/566	Power JANTX MOSFET Logic-Level FET 0.98A	1879
C	2N6903TXV	MIL-S-19500/566	Power JANTXV MOSFET Logic-Level FET 0.98A	1879
C	2N6904TX	MIL-S-19500/566	Power JANTX MOSFET Logic-Level FET 8A, 200V N-Channel	1880
C	2N6904TXV	MIL-S-19500/566	Power JANTXV MOSFET Logic-Level FET 8A, 200V N-Channel	1880
	2N7119	89009-2N7119TX & TXV	See Ref P/N	-
	2N7120	89009-2N7120TX & TXV	See Ref P/N	-
	2N7121	89009-2N7121TX & TXV	See Ref P/N	-
	2N7122	89009-2N7122TX & TXV	See Ref P/N	-
	2N7123	89007-2N7123TX & TXV	See Ref P/N	-
	2N7124	89007-2N7124TX & TXV	See Ref P/N	-
	2N7125	89007-2N7125TX & TXV	See Ref P/N	-
	2N7126	89007-2N7126TX & TXV	See Ref P/N	-
C	2N7224TX	MIL-S-19500/592	Power MOSFET JANTX 100V, 34A N-Channel TO-254AA	-
C	2N7224TXV	MIL-S-19500/592	Power MOSFET JANTXV 100V, 34A N-Channel TO-254AA	-
C	2N7225TX	MIL-S-19500/592	Power MOSFET JANTX 200V, 27A N-Channel TO-254AA	-
C	2N7225TXV	MIL-S-19500/592	Power MOSFET JANTXV 200V, 27A N-Channel TO-254AA	-
C	2N7227TX	MIL-S-19500/592	Power MOSFET JANTX 400V, 14A N-Channel TO-254AA	-
C	2N7227TXV	MIL-S-19500/592	Power MOSFET JANTXV 400V, 14A N-Channel TO-254AA	-
C	2N7228TX	MIL-S-19500/592	Power MOSFET JANTX 500V, 12A N-Channel TO-254AA	-
C	2N7228TXV	MIL-S-19500/592	Power MOSFET JANTXV 500V, 12A N-Channel TO-254AA	-
	2N7241	89025-2N7241TX & TXV	See Ref P/N	-
	2N7242	89025-2N7242TX & TXV	See Ref P/N	-
	2N7243	89025-2N7243TX & TXV	See Ref P/N	-
	2N7244	89025-2N7244TX & TXV	See Ref P/N	-
	2N7271	FRM130	See Ref P/N	3217
	2N7272	FRL130	See Ref P/N	3218
	2N7273	FRS130	See Ref P/N	3219
	2N7274	FRM230	See Ref P/N	3249
	2N7275	FRL230	See Ref P/N	3223
	2N7276	FRS230	See Ref P/N	3224
	2N7277	FRM234	See Ref P/N	3250

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
	2N7278	FRL234	See Ref P/N	3229
	2N7279	FRS234	See Ref P/N	3251
	2N7280	FRM430	See Ref P/N	3252
	2N7281	FRL430	See Ref P/N	3234
	2N7282	FRS430	See Ref P/N	3253
	2N7283	FRM140	See Ref P/N	3220
	2N7284	FRS140	See Ref P/N	3254
	2N7285	FRM240	See Ref P/N	3225
	2N7286	FRS240	See Ref P/N	3255
	2N7287	FRM244	See Ref P/N	3230
	2N7288	FRS244	See Ref P/N	3256
	2N7289	FRM440	See Ref P/N	3235
	2N7290	FRS440	See Ref P/N	3257
	2N7291	FRK150	See Ref P/N	3221
	2N7292	FRF150	See Ref P/N. Also see SEGR Rad Hard P/N FSF150.	3215
	2N7293	FRK250	See Ref P/N	3226
	2N7294	FRF250	See Ref P/N	3227
	2N7295	FRK254	See Ref P/N	3231
	2N7296	FRF254	See Ref P/N. Also see SEGR Rad Hard P/N FSF254.	3232
	2N7297	FRM450	See Ref P/N	3236
	2N7298	FRF450	See Ref P/N. Also see SEGR Rad Hard P/N FSF450.	3237
	2N7299	FRK160	See Ref P/N	3222
	2N7300	FRE160	See Ref P/N	3258
	2N7301	FRK260	See Ref P/N	3228
	2N7302	FRE260	See Ref P/N	3259
	2N7303	FRK265	See Ref P/N	3233
	2N7304	FRE264	See Ref P/N	3260
	2N7305	FRK460	See Ref P/N	3238
	2N7306	FRE460	See Ref P/N	3261
	2N7307	FRM9130	See Ref P/N	3262
	2N7308	FRL9130	See Ref P/N	3239
	2N7309	FRS9130	See Ref P/N	3240
	2N7310	FRM9230	See Ref P/N	3263
	2N7311	FRL9230	See Ref P/N	3245
	2N7312	FRS9230	See Ref P/N	3246
	2N7316	FRM9140	See Ref P/N	3241
	2N7317	FRS9140	See Ref P/N	3264
	2N7318	FRM9240	See Ref P/N	3242
	2N7319	FRS9240	See Ref P/N	3265
	2N7322	FRK9150	See Ref P/N	3266
	2N7323	FRF9150	See Ref P/N	3243
	2N7324	FRM9250	See Ref P/N	3267
	2N7325	FRF9250	See Ref P/N	3247
	2N7328	FRK9160	See Ref P/N	3244
	2N7329	FRE9160	See Ref P/N	3268
	2N7330	FRK9260	See Ref P/N	3248
	2N7331	FRE9260	See Ref P/N	3269
C	5962-85016013A	MR82C59A-5	SMD - Interrupt Controller-5MHz-28 Lead LCC	
C	5962-8501601YA	MD82C59A-5	SMD - Interrupt Controller-5MHz-28 Lead CDIP	
C	5962-85016023A	MR82C59A	SMD - Interrupt Controller-8 MHz-28 Lead LCC	

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	5962-8501602YA	MD82C59A	SMD - Interrupt Controller-8MHz-28 Lead CDIP	-
C	5962-8512703XA	HI1-574AUD	SMD - 12-Bit A to D Controller	-
C	5962-8512703YA	HI4-574AUE	SMD - 12-Bit A to D Controller	-
C	5962-8512704XA	HI1-574ATD	SMD - 12-Bit A to D Controller	-
C	5962-8512704YA	HI4-574ATE	SMD - 12-Bit A to D Controller	-
C	5962-85131013A	HI4-0546/883	SMD - 16-Channel Over-Voltage Protected MUX	-
C	5962-8513101XA	HI1-0546/883	SMD - 16-Channel Over-Voltage Protected MUX	-
C	5962-85131023A	HI4-0547/883	SMD - 8-Channel Differential O-V Protected MUX	-
C	5962-8513102XA	HI1-0547/883	SMD - 8-Channel Differential O-V Protected MUX	-
C	5962-85131032A	HI4-0549/883	SMD - 4-Channel Differential O-V Protected MUX	-
C	5962-8513103EA	HI1-0549/883	SMD - 4-Channel Differential O-V Protected MUX	-
C	5962-85131073A	HI4-0506/883	SMD - 16-Channel Differential CMOS Analog MUX	-
C	5962-8513107XA	HI1-0506/883	SMD - 16-Channel Differential CMOS Analog MUX	-
C	5962-85131083A	HI4-0507/883	SMD - 8-Channel Differential CMOS Analog MUX	-
C	5962-8513108XA	HI1-0507/883	SMD - 8-Channel Differential CMOS Analog MUX	-
C	5962-85131092A	HI4-0509/883	SMD - 4-Channel Differential CMOS Analog MUX	-
C	5962-8513109EA	HI1-0509/883	SMD - 4-Channel Differential CMOS Analog MUX	-
C	5962-8515301CA	CD54HC73/3A	SMD - Dual Brand CD54HC73/3A	-
C	5962-8515401CA	CD54HC107/3A	SMD - Dual Brand CD54HC107/3A	-
C	5962-85528012A	MR82C89	SMD - Bus Arbiter, 8MHz, 20 Lead LCC	-
C	5962-8552801RA	MD82C89	SMD - Bus Arbiter, 8MHz, 20 Lead CDIP	-
C	5962-8601601QA	MD80C88	SMD - 8/16-Bit CPU 5MHz, 40 Lead CDIP	-
C	5962-8601601XA	MR80C88	SMD - 8/16-Bit CPU 5MHz, 44 Lead LCC	-
C	5962-8606101EA	CD54HC157/3A	SMD - Dual Brand CD54HC157/3A	-
C	5962-8606201RA	CD54HC563/3A	SMD - Dual Brand CD54HC563/3A	-
C	5962-8670101JA	CD54HCT154/3A	SMD - Dual Brand CD54HCT154/3A	-
C	5962-86716012A	HI4-0201HS/883	SMD - Hi-Speed Quad SPST CMOS Switch	-
C	5962-8671601EA	HI1-0201HS/883	SMD - Hi-Speed Quad SPST CMOS Switch	-
C	5962-8681201EA	CD54HC368/3A	SMD - Dual Brand CD54HC368/3A	-
C	5962-8681301RA	CD54HC533/3A	SMD - Dual Brand CD54HC533/3A	-
C	5962-8681401RA	CD54HC534/3A	SMD - Dual Brand CD54HC534/3A	-
C	5962-8681501RA	CD54HC564/3A	SMD - Dual Brand CD54HC564/3A	-
C	5962-8681701EA	CD54HC597/3A	SMD - Dual Brand CD54HC597/3A	-
C	5962-8681801RA	CD54HC688/3A	SMD - Dual Brand CD54HC688/3A	-
C	5962-8681901EA	CD54HC4049/3A	SMD - Dual Brand CD54HC4049/3A	-
C	5962-8682001EA	CD54HC4050/3A	SMD - Dual Brand CD54HC4050/3A	-
C	5962-8682101EA	CD54HC42/3A	SMD - Dual Brand CD54HC42/3A	-
C	5962-8682201JA	CD54HC154/3A	SMD - Dual Brand CD54HC154/3A	-
C	5962-8682301EA	CD54HC158/3A	SMD - Dual Brand CD54HC158/3A	-
C	5962-8682401EA	CD54HC160/3A	SMD - Dual Brand CD54HC160/3A	-
C	5962-8682501EA	CD54HC172/3A	SMD - Dual Brand CD54HC173/3A	-
C	5962-8682601EA	CD54HC194/3A	SMD - Dual Brand CD54HC194/3A	-
C	5962-8682701EA	CD54HC195/3A	SMD - Dual Brand CD54HC195/3A	-
C	5962-8682801EA	CD54HC366/3A	SMD - Dual Brand CD54HC366/3A	-
C	5962-8683101CA	CD54HCT00/3A	SMD - Dual Brand CD54HCT00/3A	-
C	5962-8684701EA	CD54HC123/3A	SMD - Dual Brand CD54HC123/3A	-
C	5962-8684801CA	CD54HC126/3A	SMD - Dual Brand CD54HC126/3A	-
C	5962-8685201CA	CD54HC32/3A	SMD - Dual Brand CD54HCT32/3A	-
C	5962-8685301CA	CD54HCT74/3A	SMD - Dual Brand CD54HCT74/3A	-
C	5962-8685401EA	CD54HCT161/3A	SMD - Dual Brand CD54HCT161/3A/3A	-

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	5962-8685501EA	CD54HCT165/3A	SMD - Dual Brand CD54HCT165/3A	-
C	5962-8685601RA	CD54HCT573/3A	SMD - Dual Brand CD54HCT573/3A	-
C	5962-8685701RA	CD54HCT688/3A	SMD - Dual Brand CD54HCT688/3A	-
C	5962-86860012A	HA4-4902/883	SMD - Quad Comparator	-
C	5962-8686001EA	HA1-4902/883	SMD - Quad Comparator	-
C	5962-8686701RA	CD54HCT373/3A	SMD - Dual Brand CD54HCT373/3A	-
C	5962-86879013A	HS4-3182	SMD-ARINC Bus Interface Line Driver-LCC	-
C	5962-8687901EA	HS1-3182	SMD-ARINC Bus Interface Line Driver-16 Lead CDIP	-
C	5962-8688001QA	HS1-3282	SMD-ARINC Bus Interface Circuit, 40 Lead CDIP	-
C	5962-8688001XA	HS4-3282	SMD-ARINC Bus Interface Circuit, 44 Lead LCC	-
C	5962-8688301CA	CD54HCT08/3A	SMD - Dual Brand CD54HCT08/3A	-
C	5962-8688401EA	CD54HC238/3A	SMD - Dual Brand CD54HC238/3A	-
C	5962-8688501JA	CD54HC646/3A	SMD - Dual Brand CD54HC646/3A	-
C	5962-8688601EA	CD54HC4538/3A	SMD - Dual Brand CD54HC4538/3A	-
C	5962-8689001CA	CD54HCT14/3A	SMD - Dual Brand CD54HCT14/3A	-
C	5962-8689101EA	CD54HC191/3A	SMD - Dual Brand CD54HC191/3A	-
C	5962-87577012A	MR82C86H-5	SMD - Octal Inverting XCVR, 5MHz, 20 Lead LCC	-
C	5962-8757701RA	MD82C86H-5	SMD - Octal Inverting XCVR, 5MHz, 20 Lead CDIP	-
C	5962-87577022A	MR82C87H-5	SMD - Octal Inverting XCVR 5MHz, 20 Lead LCC	-
C	5962-8757702RA	MD82C87H-5	SMD - Octal Inverting XCVR 5MHz, 20 Lead CDIP	-
C	5962-8764701CA	CD54HC03/3A	SMD - Dual Brand CD54HC03/3A	-
C	5962-8765301JA	ICM7170MDG/883B	SMD - Real-Time Clock	-
C	5962-8766001G	ICL7667MTV/883B	SMD - Driver, Power MOSFET	-
C	5962-8766001PA	ICL7667MJA/883B	SMD - Driver, Power MOSFET	-
C	5962-87677012A	HA4-5330/883	SMD - High Speed Sample and Hold, 500ns	-
C	5962-8767701CA	HA1-5330/883	SMD - High Speed Sample and Hold, 500ns	-
C	5962-8768001EA	CD54HC4060/3A	SMD - Dual Brand CD54HC4060/3A	-
C	5962-8772101CA	CD54HC125/3A	SMD - Dual Brand CD54HC125/3A	-
C	5962-8772201CA	CD54HC4075/3A	SMD - Dual Brand CD54HC4075/3A	-
C	5962-8772401EA	CD54HC193/3A	SMD - Dual Brand CD54HC193/3A	-
C	5962-8772501RA	CD54HCT273/3A	SMD - Dual Brand CD54HCT273/3A	-
C	5962-8773301EA	CD54HC4511/3A	SMD - Dual Brand CD54HC4511/3A	-
C	5962-8775401EA	CD54HC4053/3A	SMD - Dual Brand CD54HC4053/3A	-
C	5962-87783012A	HA4-2400/883	SMD - 4-Channel Programmable Op Amp	-
C	5962-8778301EA	HA1-2400/883	SMD - 4-Channel Programmable Op Amp	-
C	5962-87784012A	HA4-5190/883	SMD - Fast Settling Op Amp 20 TER	-
C	5962-8778401CA	HA1-5190/883	SMD - Fast Settling Op Amp 14 Lead	-
C	5962-8778401X	HA2-5190/883	SMD - Fast Settling Op Amp 12 Lead	-
C	5962-8778501XA	HA2-2541/883	SMD - High Slew Rate Op Amp	-
C	5962-8778503CA	HA1-2841/883	SMD - Wide Band, Fast Settling Op Amp	-
C	5962-8778503PA	HA7-2841/883	SMD - Wide Band, Fast Settling Op Amp	-
C	5962-87787012A	HA4-2539/883	SMD - High Slew Rate Op Amp	-
C	5962-8778701CA	HA1-2539/883	SMD - High Slew Rate Op Amp	-
C	5962-8780501EA	CD54HC221/3A	SMD - Dual Brand CD54HC221/3A	-
C	5962-8780601RA	CD54HC299/3A	SMD - Dual Brand CD54HC299/3A	-
C	5962-8780701RA	CD54HC377/3A	SMD - Dual Brand CD54HC377/3A	-
C	5962-8780801EA	CD54HC192/3A	SMD - Dual Brand CD54HC192/3A	-
C	5962-8780901RA	CD54HC640/3A	SMD - Dual Brand CD54HC640/3A	-
C	5962-88502012A	HA4-5104/883	SMD - Quad High Performance Op Amp	-
C	5962-8850201CA	HA1-5104/883	SMD - Quad High Performance Op Amp	-

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	5962-8855601EA	CD54HC4052/3A	SMD - Dual Brand CD54HC4052/3A	-
C	5962-8857601CA	CD54HC21/3A	SMD - Dual Brand CD54HC21/3A	-
C	5962-8860601EA	CD54HC237/3A	SMD - Dual Brand CD54HC237/3A	-
C	5962-8862401JA	CD54HCT4059/3A	SMD - Dual Brand CD54HCT4059/3A	-
C	5962-8867101EA	CD54HCT191/3A	SMD - Dual Brand CD54HCT191/3A	-
C	5962-8867201EA	CD54HCT85/3A	SMD - Dual Brand CD54HCT85/3A	-
C	5962-88690013A	HM4-6642/883	SMD - 512 x 8 CMOS PROM LCC	-
C	5962-8869001JA	HM1-6642/883	SMD - 512 x 8 CMOS PROM DIP	-
C	5962-8869001LA	HM6-6642/883	SMD - 512 x 8 CMOS PROM Slim CerDIP	-
C	5962-88690023A	HM4-6642B/883	SMD - 512 x 8 CMOS PROM6642B LCC	-
C	5962-8869002JA	HM1-6642B/883	SMD - 512 x 8 CMOS PROM6642B DIP	-
C	5962-8869002LA	HM6-6642B/883	SMD - 512 x 8 CMOS PROM6642B Slim CerDIP	-
C	5962-88699013A	HI4-0516/883	SMD - 16-Channel/Differential 8-Channel CMOS MUX	-
C	5962-8869901XA	HI1-0516/883	SMD - 16-Channel/Differential 8-Channel CMOS MUX	-
C	5962-8875001EA	IH5352MJE/883B	SMD - Quad SPST RF/Video Switch	-
C	5962-8875701EA	CD54HCT4046A/3A	SMD - Dual Brand CD54HCT4046A/3A	-
C	5962-8875901EA	CD54HCT173/3A	SMD - Dual Brand CD54HCT173/3A	-
C	5962-8877201CA	ICL8038MJD/883B	SMD - Waveform Generator 250pp	-
C	5962-8943601MRA	CD54HCT299/3A	SMD - Dual Brand CD54HCT299/3A	-
C	5962-8944501JA	CD54HC4059/3A	SMD - Dual Brand CD54HC4059/3A	-
C	5962-8945801EA	CD54HCT4020/3A	SMD - Dual Brand CD54HCT4020/3A	-
C	5962-89502012A	HA4-2544/883	SMD - High Slew Rate Video Op Amp	-
C	5962-8950201G	HA2-2544/883	SMD - High Slew Rate Video Op Amp	-
C	5962-8950201PA	HA7-2544/883	SMD - High Slew Rate Video Op Amp	-
C	5962-8950303G	ICM7555MTV/883B	SMD - CMOS 555 General Purpose Timer	-
C	5962-8950304CA	ICM7556MJD/883B	SMD - CMOS Dual General Purpose Timer	-
C	5962-8954001JA	HM1-6617/883	SMD - 2K x 8 CMOS PROM DIP	-
C	5962-8954001LA	HM6-6617/883	SMD - 2K x 8 CMOS PROM Slim CerDIP	-
C	5962-8954001XA	HM4-6617/883	SMD - 2K x 8 CMOS PROM LCC	-
C	5962-8954002JA	HM1-6617B/883	SMD - 2K x 8 CMOS PROM DIP	-
C	5962-8954002LA	HM6-6617B/883	SMD - 2K x 8 CMOS PROM Slim CerDIP	-
C	5962-8954002XA	HM4-6617B/883	SMD - 2K x 8 CMOS PROM LCC	-
C	5962-89548012A	HA4-5102/883	SMD - Dual High Performance Op Amp	-
C	5962-8954801G	HA2-5102/883	SMD - Dual High Performance Op Amp	-
C	5962-8954801PA	HA7-5102/883	SMD - Dual High Performance Op Amp	-
C	5962-8960901EA	CD54HC4046A/3A	SMD - Dual Brand CD54HC4046A/3A	-
C	5962-89620012A	HA4-5020/883	SMD - Sample and Hold Op Amp	-
C	5962-8962001PA	HA7-5020/883	SMD - Sample and Hold Op Amp	-
C	5962-89627012A	HA4-5127/883	SMD - Precision Op Amp (OP27)	-
C	5962-8962701G	HA2-5127/883	SMD - Precision Op Amp (OP27)	-
C	5962-8962701PA	HA7-5127/883	SMD - Precision Op Amp (OP27)	-
C	5962-89627022A	HA4-5137/883	SMD - Precision Op Amp (OP27) Ultra Low Noise	-
C	5962-8962702G	HA2-5137/883	SMD - Precision Op Amp (OP27) Ultra Low Noise	-
C	5962-8962702PA	HA7-5137/883	SMD - Precision Op Amp (OP27) Ultra Low Noise	-
C	5962-89627032A	HA4-5147/883	SMD - Precision Op Amp LCC	-
C	5962-8962703G	HA2-5147/883	SMD - Precision Op Amp 8 Pin Can	-
C	5962-8962703PA	HA7-5147/883	SMD - Precision Op Amp 8 Lead CDIP	-
C	5962-89631012A	HA4-5111/883	SMD - Low Noise Op Amp 20 TER LCC	-
C	5962-8963101G	HA2-5111/883	SMD - Low Noise Op Amp 8 Pin Can	-
C	5962-8963101PA	HA7-5111/883	SMD - Low Noise Op Amp 8 Lead CDIP	-

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	5962-89632012A	HA4-5112/883	SMD - Dual Low Noise Op Amp 20 TER LCC	-
C	5962-8963201G	HA2-5112/883	SMD - Dual Low Noise Op Amp 8 Lead	-
C	5962-8963201PA	HA7-5112/883	SMD - Dual Low Noise Op Amp 8 Lead	-
C	5962-8963301X	HA2-5033/883	SMD - Video Buffer (TO-8) 12 Pin Can	-
C	5962-89634012A	HA4-5144/883	SMD - Quad Low Noise, High Performance Op Amp	-
C	5962-8963401CA	HA1-5114/883	SMD - Quad Low Noise Op Amp, CDIP	-
C	5962-89635012A	HA4-5101/883	SMD - Low Noise Op Amp LCC	-
C	5962-8963501PA	HA7-5101/883	SMD - Low Noise Op Amp, CDIP	-
C	5962-89636012A	HA4-5002/883	SMD - High Slew Rate Buffer	-
C	5962-8963601G	HA2-5002/883	SMD - High Slew Rate Buffer	-
C	5962-8963601PA	HA7-5002/883	SMD - High Slew Rate Buffer	-
C	5962-8964301X	HA2-2542/883	SMD - Wideband High Output Current Op Amp	-
C	5962-89648012A	HA2-2540/883	SMD - High Slew Rate Op Amp, 400V	-
C	5962-8964801CA	HA1-2540/883	SMD - High Slew Rate Op Amp, 400V	-
C	5962-89656022A	HA4-5142/883	SMD - Dual Ultra Low Power Op Amp	-
C	5962-8965602G	HA2-5142/883	SMD - Dual Ultra Low Power Op Amp	-
C	5962-8965602PA	HA7-5142/883	SMD - Dual Ultra Low Power Op Amp	-
C	5962-89656032A	HA4-5144/883	SMD - Quad Ultra Low Power Op Amp	-
C	5962-8965603CA	HA1-5144/883	SMD - Quad Ultra Low Power Op Amp	-
C	5962-8970001EA	CD54HCT123/3A	SMD - Dual Brand CD54HCT123/3A	-
C	5962-8970101EA	CD54HCT175/3A	SMD - Dual Brand CD54HCT175/3A	-
C	5962-8970201EA	CD54HCT112/3A	SMD - Dual Brand CD54HCT112/3A	-
C	5962-8970301CA	CD54HCT27/3A	SMD - Dual Brand CD54HCT27/3A	-
C	5962-8970401CA	CD54HCT164/3A	SMD - Dual Brand CD54HCT164/3A	-
C	5962-8970501EA	CD54HCT257/3A	SMD - Dual Brand CD54HCT257/3A	-
C	5962-8970701EA	CD54HCT257/3A	SMD - Dual Brand CD54HCT162/3A	-
C	5962-8970801EA	CD54HCT258/3A	SMD - Dual Brand CD54HCT258/3A	-
C	5962-8970901CA	CD54HCT11/3A	SMD - Dual Brand CD54HCT11/3A	-
C	5962-89721012A	HA4-2529/883	SMD - Op Amp, High Slew Rate	-
C	5962-8972101G	HA2-2529/883	SMD - Op Amp, High Slew Rate	-
C	5962-8972101PA	HA7-2529/883	SMD - Op Amp, High Slew Rate	-
C	5962-8974001RA	CD54HCT640/3A	SMD - Dual Brand CD54HCT640/3A	-
C	5962-8974201RA	CD54HCT574/3A	SMD - Dual Brand CD54HCT574/3A	-
C	5962-8974301EA	CD54HCT174/3A	SMD - Dual Brand CD54HCT174/3A	-
C	5962-8974501EA	CD54HCT238/3A	SMD - Dual Brand CD54HCT238/3A	-
C	5962-8974601CA	CD54HCT30/3A	SMD - Dual Brand CD54HCT30/3A	-
C	5962-8974701CA	CD54HCT04/3A	SMD - Dual Brand CD54HCT04/3A	-
C	5962-8975101CA	CD54HCT02/3A	SMD - Dual Brand CD54HCT02/3A	-
C	5962-8976301MEA	DG403AK/883	SMD - Dual Brand DG403AK Switch	-
C	5962-8976501EA	CD54HC283/3A	SMD - Dual Brand CD54HC283/3A	-
C	5962-8976901RA	CD54HCT377/3A	SMD - Dual Brand CD54HCT377/3A	-
C	5962-8977101EA	CD54HCT4060/3A	SMD - Dual Brand CD54HCT4060/3A	-
C	5962-8984201G	ICL8211MTY/883B	SMD - Voltage Ref/Indicator	-
C	5962-8984202G	ICL8212MTY/883B	SMD - Voltage Ref/Indicator	-
C	5962-8984301CA	CD54HCT10/3A	SMD - Dual Brand CD54HCT10/3A	-
C	5962-8984401CA	CD54HCT86/3A	SMD - Dual Brand CD54HCT86/3A	-
C	5962-8984501CA	CD54HCT132/3A	SMD - Dual Brand CD54HCT132/3A	-
C	5962-8984901RA	CD54HCT534/3A	SMD - Dual Brand CD54HCT534/3A	-
C	5962-8985201EA	CD54HCT259/3A	SMD - Dual Brand CD54HCT259/3A	-
C	5962-89880012A	HA4-2522/883	SMD - High Slew Rate Op Amp	-

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	5962-8988001G	HA2-2522/883	SMD - High Slew Rate Op Amp	-
C	5962-8988001PA	HA7-2522/883	SMD - High Slew Rate Op Amp	-
C	5962-8988002G	HA2-2520/883	SMD - High Slew Rate Op Amp	-
C	5962-8988002PA	HA7-2520/883	SMD - High Slew Rate Op Amp	-
C	5962-8989001CA	CD54HCT393/3A	SMD - Dual Brand CD54HCT393/3A	-
C	5962-8994601EA	CD54HC190/3A	SMD - Dual Brand CD54HC190/3A	-
C	5962-8994701MEA	CD54HCT4040/3A	SMD - Dual Brand CD54HCT4040/3A	-
C	5962-8995301EA	CD54HC4015/3A	SMD - Dual Brand CD54HC4015/3A	-
C	5962-8995401EA	CD54HC4520/3A	SMD - Dual Brand CD54HC4520/3A	-
C	5962-8996101EA	DG405AK/883	SMD - Dual Brand G405AK Switch	-
C	5962-8999001EA	CD54HC297/3A	SMD - Dual Brand CD54HC297/3A	-
C	5962-9050501MEA	CD54HCT153/3A	SMD - Dual Brand CD54HCT153/3A	-
C	5962-9052401MEA	CD54HCT251/3A	SMD - Dual Brand CD54HCT251/3A	-
C	5962-9052501MQA	HD1-6402R/883	SMD - UART, 2MHz, 40 Lead CDIP	-
C	5962-9052502MQA	HD1-6402B/883	SMD - UART, 8MHz, 40 Lead CDIP	-
C	5962-9054301MQA	MD82C37A-5	SMD - Programmable DMA Controller	-
C	5962-9054301MXA	MR82C37A-5	SMD - Programmable DMA Controller	-
C	5962-9054302MQA	MD32C37A	SMD - Programmable DMA Controller	-
C	5962-9054302MXA	MR82C37A	SMD - Programmable DMA Controller	-
C	5962-9054303MQA	MD82C37A-12	SMD - Programmable DMA Controller	-
C	5962-9054303MXA	MR82C37A-12	SMD - Programmable DMA Controller	-
C	5962-9054304MQA	MD82C237	SMD - Programmable DMA Controller	-
C	5962-9054304MXA	MR82C237	SMD - Programmable DMA Controller	-
C	5962-9054305MQA	MD82C237-12	SMD - Programmable DMA Controller	-
C	5962-9054305MXA	MR82C237-12	SMD - Programmable DMA Controller	-
C	5962-9055301EA	CD54HC40103/3A	SMD - Dual Brand CD54HC40103/3A	-
C	5962-9055701EA	CD14538B/3A	SMD - Dual Brand CD14538B/3A	-
C	5962-9056901EA	DG401AK/883	SMD - Dual Brand DG401AK Switch	-
C	5962-9057401EA	CD54HCT40102/3A	SMD - Dual Brand CD54HCT40102/3A	-
C	5962-9059701MEA	CD54HCT4017/3A	SMD - Dual Brand CD54HCT4017/3A	-
C	5962-9064001CA	CD4016B/3A	SMD - Dual Brand CD4016B/3A	-
C	5962-9065101MCA	CD54HCT126/3A	SMD - Dual Brand CD54HCT126/3A	-
C	5962-9065201MEA	CD54HCT151/3A	SMD - Dual Brand CD54HCT151/3A	-
C	5962-9065401MEA	CD54HCT4051/3A	SMD - Dual Brand CD54HCT4051/3A	-
C	5962-9067801MX	MG80C286-10/883	SMD - 16-Bit CPU 10MHz, 68 Lead PGA	-
C	5962-9067802MX	MG80C286-12/883	SMD - 16-Bit CPU 12MHz, 68 Lead PGA	-
C	5962-9070101MEA	CD54HCT109/3A	SMD - Dual Brand CD54HCT109/3A	-
C	5962-9070201MEA	CD54HCT157/3A	SMD - Dual Brand CD54HCT157/3A	-
C	5962-9070301MEA	CD54HCT158/3A	SMD - Dual Brand CD54HCT158/3A	-
C	5962-9070501MEA	CD54HCT160/3A	SMD - Dual Brand CD54HCT160/3A	-
C	5962-9070601MEA	CD54HCT367/3A	SMD - Dual Brand CD54HCT367/3A	-
C	5962-9073101MEA	DG411AK/883	SMD - Dual Brand DG411AK Switch	-
C	5962-9073102MEA	DG412AK/883	SMD - Dual Brand DG412AK Switch	-
C	5962-9073103MEA	DG413AK/883	SMD - Dual Brand DG413AK Switch	-
C	5962-9075801MEA	CD54HCT75/3A	SMD - Dual Brand CD54HCT75/3A	-
C	5962-9084801MEA	CD54HCT193/3A	SMD - Dual Brand CD54HCT193/3A	-
C	5962-9084901MCA	CD54HCT107/3A	SMD - Dual Brand CD54HCT107/3A	-
C	5962-9088801M2A	HD4-6409/883	SMD - CMOS Manchester Encoder Decoder	-
C	5962-9088801MRA	HD1-6409/883	SMD - CMOS Manchester Encoder Decoder	-
C	5962-9098401MEA	CD54HCT390/3A	SMD - Dual Brand CD54HCT390/3A	-

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	5962-9163001MEA	CD54HCT4052/3A	SMD - Dual Brand CD54HCT4052/3A	-
C	5962-9163401M2A	HA4-5221/883	SMD - Op Amp - High Performance Wide Band	-
C	5962-9163401MPA	HA7-5221/883	SMD - Op Amp - High Performance Wide Band	-
C	5962-9163402M2A	HA4-5222/883	SMD - Op Amp - Dual, High Performance Wide Band	-
C	5962-9163402MPA	HA7-5222/883	SMD - Op Amp - Dual, High Performance Wide Band	-
C	5962-9204101MEA	DG441AK/883	SMD - Dual Brand SMD DG441AK Switch	-
C	5962-9204102MEA	DG442AK/883	SMD - Dual Brand SMD DG442AK Switch	-
C	5962-9204201MEA	DG408AK/883	SMD - Dual Brand DG408AK MUX	-
C	5962-9204202MEA	DG409AK/883	SMD - Dual Brand DG409AK MUX	-
C	5962-9209701MX	HSP43891GM-20/883	SMD - FIR Filter, 8 Tap, 9-Bit, Dual Brand	-
C	5962-9209702MX	HSP43890GM-25/883	SMD - FIR Filter, 8 Tap, 9-Bit, Dual Brand	-
C	5962-9300701MX	HSP48908GM-20/883	SMD - 2 D Convolver, Dual Brand	-
C	5962-9300702MX	HSP48908GM-27/883	SMD - 2 S Convolver, Dual Brand	-
C	5962-9306301M2A	HA4-5340/883	SMD - Op Amp - High Speed Sample/Hold	-
C	5962-9306301MCA	HA1-5340/883	SMD - Op Amp - High Speed Sample/Hold	-
C	5962-9306302M2A	HA4-5320/883	SMD - Op Amp - Sample/Hold	-
C	5962-9306302MCA	HA1-5320/883	SMD - Op Amp - Sample/Hold	-
C	5962-9309501MEA	HA1-2444/883	SMD - Op Amp, 4-Channel, MUXED Output	-
C	5962-9325101M2A	HA4-2546/883	SMD - Multiplier, 2 Quad, Voltage Output	-
C	5962-9325101MEA	HA1-2546/883	SMD - Multiplier, 2 Quad, Voltage Output	-
C	5962-9455301M2A	HA4-5134/883	SMD - Op Amp - Quad Precision	-
C	5962-9455301MCA	HA1-5134/883	SMD - Op Amp - Quad Precision	-
C	5962-9456201M2A	HI4-0222/883	SMD - Dual SPST Video Switch	-
C	5962-9456201MCA	HI1-0222/883	SMD - Dual SPST Video Switch	-
C	5962-9457301MX	HSP48410GM-25/883	SMD - Histogrammer, Dual Brand	-
C	5962-9457302MX	HSP48410GM-33/883	SMD - Histogrammer, Dual Brand	-
C	5962-9467601MPA	HFA1100MJ/883	SMD - Current Feedback Amp, Ultra High Speed	-
C	5962-9467801MXA	HI1-5700S/883	SMD - Flash A/D Converter, 8-Bit, 20 MSPS	-
C	5962-9467901MPA	HA7-2840/883	SMD - Op Amp, Wide Band, High Slew Rate	-
C	5962-9468201M2A	HFA1113ML/883	SMD - Buffer Amp, Ultra High Speed, Programmable Gain	-
C	5962-9468201MPA	HFA1113MJ/883	SMD - Buffer Amp, Ultra High Speed, Programmable Gain	-
C	5962-9468301MPA	HFA1110MJ/883	SMD - Buffer Amp, Closed Loop, 750MHz	-
C	5962-9468501MPA	HFA1120MJ/883	SMD - Current Feedback Amp	-
C	5962-9469401MPA	HA7-2842/883	SMD - Op Amp - Video	-
C	5962H9215301QX		SMD - Rad Hard, 32K x 8 SRAM	-
C	7702002EA	CD4502B/3A	SMD - Dual Brand CD4502B/3A	-
C	7702301EA	CD4520B/3A	SMD - Dual Brand CD4520B/3A	-
C	7702402CA	CD4081B/3A	SMD - Dual Brand CD4081B/3A	-
C	7702501EA	CD4094B/3A	SMD - Dual Brand CD4094B/3A	-
C	7703201JA	CD4515B/3A	SMD - Dual Brand CD4515B/3A	-
C	7703702EA	CD4585B/3A	SMD - Dual Brand CD4585B/3A	-
C	7704402CA	CD4078B/3A	SMD - Dual Brand CD4078B/3A	-
C	7704403CA	CD4002B/3A	SMD - Dual Brand CD4002B/3A	-
C	7704602CA	CD4093B/3A	SMD - Dual Brand CD4093B/3A	-
C	7704701EA	CD4555B/3A	SMD - Dual Brand CD4555B/3A	-
C	7704801EA	CD4556B/3A	SMD - Dual Brand CD4556B/3A	-
C	7705102CA	CD4073B/3A	SMD - Dual-Brand CD4073B/3A	-
C	77052012A	HI4-0508	SMD - 8-Channel CMOS Analog MUX	-

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	7705201E	HI1-0508	SMD - 8-Channel CMOS Analog MUX	-
C	77052022A	HI4-0548/883	SMD - 8-Channel Over-Voltage Protected	-
C	7705202EA	HI1-0548/883	SMD - 8-Channel Over-Voltage Protected	-
C	7705301EA	DG201AAK/883B	SMD - Quad SPST CMOS Analog Switch	-
C	77053022A	HI4-0201/883	SMD - Quad SPST CMOS Analog Switch	-
C	7705302EA	HI1-0201/883	SMD - Quad SPST CMOS Analog Switch	-
C	7705902CA	CD4082B/3A	SMD - Dual Brand CD4082B/3A	-
C	7706002CA	CD4072B/3A	SMD - Dual Brand CD4072B/3A	-
C	78003022A	HA4-2640/883	SMD - High Voltage Op Amp(\xb1 40V, USEC)	-
C	7800302G	HA7-2640/883	SMD - High Voltage Op Amp(\xb1 40V, USEC)	-
C	7800302PA	HA2-2640/883	SMD - High Voltage Op Amp(\xb1 40V, USEC)	-
C	78029013A	HD4-15530	SMD - Manchester Encoder/Decoder, 28 Lead LCC	-
C	7802901JA	HD1-15530	SMD - Manchester Encoder/Decoder, 24 Lead CDIP	-
C	7901502EA	CD4052B/3A	SMD - Dual Brand CD4052B/3A	-
C	80016012A	HA4-2420/883	SMD - Sample/Hold Amp, LCC	-
C	8001601CA	HA1-2420/883	SMD - Sample/Hold Amp, CDIP	-
C	8100604EA	IH5043MJE/883B	SMD - Dual SPDT CMOS Analog Switch	-
C	8100609EA/INT	IH5140MJE/883B	SMD - SPST CMOS Analog Switch	-
C	8100609EA/MLB	HI1-5040/883	SMD - SPST CMOS Analog Switch	-
C	8100610EA/INT	IH5141MJE/883B	SMD - Dual SPST CMOS Analog Switch	-
C	8100610EA/MLB	HI1-5041/883	SMD - Dual SPST CMOS Analog Switch	-
C	8100611EA/INT	IH5142MJE/883B	SMD - SPDT CMOS Analog Switch	-
C	8100611EA/MLB	HI1-5042/883	SMD - SPDT CMOS Analog Switch	-
C	81006122A	HI4-5043/883	SMD - Dual SPDT CMOS Analog Switch	-
C	8100612EA/INT	IH5143MJE/883	SMD - Dual SPDT CMOS Analog Switch	-
C	8100612EA/MLB	HI1-5043/883	SMD - Dual SPDT CMOS Analog Switch	-
C	8100613EA/INT	IH5144MJE/883B	SMD - DPST CMOS Analog Switch	-
C	8100613EA/MLB	HI1-5044/883	SMD - DPST CMOS Analog Switch	-
C	81006142A	HI4-5045/883	SMD - Dual SPDT CMOS Analog Switch	-
C	8100614EA/INT	IH5145MJE/883B	SMD - Dual DPST CMOS Analog Switch	-
C	8100614EA/MLB	HI1-5045/883	SMD - Dual DPST CMOS Analog Switch	-
C	8100615EA/MLB	HI1-5046/883	SMD - DPDT CMOS Analog Switch	-
C	8100616EA/MLB	HI1-5047/883	SMD - 4PST CMOS Analog Switch	-
C	8100617EA/MLB	HI1-5046A/883	SMD - DPDT CMOS Analog Switch	-
C	8100618EA/MLB	HI1-5047A/883	SMD - 4PST CMOS Analog Switch	-
C	8100619EA/MLB	HI1-5048/883	SMD - Dual SPST CMOS Analog Switch	-
C	81006202A	HI4-5049/883	SMD - Dual DPST CMOS Analog Switch	-
C	8100620EA/MLB	HI1-5049/883	SMD - Dual DPST CMOS Analog Switch	-
C	8100621EA/MLB	HI1-5050/883	SMD - SPDT CMOS Analog Switch	-
C	81006222A	HI4-5051/883	SMD - Dual SPDT CMOS Analog Switch	-
C	8100622EA/INT	IH5151MJE/883B	SMD - Dual SPDT CMOS Analog Switch	-
C	8100622EA/MLB	HI1-5051/883	SMD - Dual SPDT CMOS Analog Switch	-
C	8101602EA	CD4029B/3A	SMD - Dual Brand CD4029B/3A	-
C	8101701EA	CD4035B/3A	SMD - Dual Brand CD4035B/3A	-
C	8101801EA	CD4053B/3A	SMD - Dual Brand CD4053B/3A	-
C	8102001CA	CD4047B/3A	SMD - Dual Brand CD4047B/3A	-
C	8102401VA	HM1-6504S	SMD - 4096 x 1 RAM DIP Package	-
C	8102402VA	HM4-6504	SMD - 4096 x 1 RAM LCC Package	-
C	8102403VA	HM1-6504B/883	SMD - 4096 x 1 RAM DIP Package	-
C	8102404VA	HM4-6504B	SMD - 4096 x 1 RAM LCC Package	-

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	8102405VA	HM1-6504	SMD - 4096 x 1 RAM DIP Package	-
C	8102406VA	HM1-6514/883	SMD - 1024 x 4 RAM DIP Package	-
C	8403601JA	HM1-6516/883	SMD - 2048 x 8 RAM DIP Package	-
C	8403601ZA	HM4-6516	SMD - 2048 x 8 RAM LCC Package	-
C	8403602JA	HM1-65162/883	SMD - 2048 x 8 RAM DIP Package	-
C	8403602ZA	HM4-65162/883	SMD - 2048 x 8 RAM LCC Package	-
C	8403603JA	HM1-65162C/883	SMD - 2048 x 8 RAM DIP Package	-
C	8403603ZA	HM4-65162	SMD - 2048 x 8 RAM LCC Package	-
C	8403606JA	HM1-65162B/883	SMD - 2048 x 8 RAM DIP Package	-
C	8403606ZA	HM4-65162B/883	SMD - 2048 x 8 RAM LCC Package	-
C	8403607JA	HM1-6516B/883	SMD - 2048 x 8 RAM DIP Package	-
C	8403607ZA	HM4-6516B/883	SMD - 2048 x 8 RAM LCC Package	-
C	8403701CA	CD54HC00/3A	SMD - Dual Brand CD54HC00/3A	-
C	8403801CA	CD54HC10/3A	SMD - Dual Brand CD54HC10/3A	-
C	8403901CA	CD54HC20/3A	SMD - Dual Brand CD54HC20/3A	-
C	8404001CA	CD54HC30/3A	SMD - Dual Brand CD54HC30/3A	-
C	8404101CA	CD54HC02/3A	SMD - Dual Brand CD54HC02/3A	-
C	8404201CA	CD54HC27/3A	SMD - Dual Brand CD54HC27/3A	-
C	8404302CA	CD54HC7266/3A	SMD - Dual Brand CD54HC7266/3A	-
C	8404401CA	CD54HC4002/3A	SMD - Dual Brand CD54HC4002/3A	-
C	8404501CA	CD54HC32/3A	SMD - Dual Brand CD54HC32/3A	-
C	8404601CA	CD54HC86/3A	SMD - Dual Brand CD54HC86/3A	-
C	8404701CA	CD54HC08/3A	SMD - Dual Brand CD54HC08/3A	-
C	8404801CA	CD54HC11/3A	SMD - Dual Brand CD54HC11/3A	-
C	8405201QA	MD80C86	SMD - 16-Bit CPU, 5MHz, 40 Lead CDIP	-
C	8405201XA	MR80C86	SMD - 16-Bit CPU, 5MHz, 44 Lead LCC	-
C	8405202QA	MD80C86-2	SMD - 16-Bit CPU, 8MHz, 40 Lead CDIP	-
C	8405202XA	MR80C86-2	SMD - 16-Bit CPU, 8MHz, 44 Lead LCC	-
C	8405601CA	CD54HC74/3A	SMD - Dual Brand CD54HC74/3A	-
C	8406201EA	CD54HC138/3A	SMD - Dual Brand CD54HC138/3A	-
C	8406401EA	CD54HC147/3A	SMD - Dual Brand CD54HC147/3A	-
C	84065013A	MR82C54	SMD - Programmable Interval Timer, 8MHz, 28 Lead LCC	-
C	8406501JA	MD82C54	SMD - Programmable Interval Timer, 8MHz, 24 Lead CDIP	-
C	84065023A	MR82C54-5	SMD - Programmable Interval Timer, 12MHz, 28 Lead LCC	-
C	8406502JA	MD82C54-5	SMD - Programmable Interval Timer, 12MHz, 24 Lead CDIP	-
C	8406601QA	MD82C55A-5	SMD - Programmable Peripheral, 5MHz, 40 Lead CDIP	-
C	8406601XA	MR82C55A-5	SMD - Programmable Peripheral, 5MHz, 44 Lead LCC	-
C	8406602QA	MD82C55A	SMD - Programmable Peripheral, 8MHz, 40 Lead CDIP	-
C	8406602XA	MR82C55A	SMD - Programmable Peripheral, 8MHz, 44 Lead LCC	-
C	84067012A	MR82C82	SMD - Octal Latch Bus Driver, 20 Lead LCC	-
C	8406701RA	MD82C82	SMD - Octal Latch Bus Driver, 20 Lead CDIP	-
C	84067022A	MR82C83H	SMD - Inverting Octal Latch Driver, 20 Lead LCC	-
C	8406702RA	MD82C83H	SMD - Inverting Octal Latch Driver, 20 Lead CDIP	-
C	84068012A	MR82C84A	SMD - Clock Generator, 8MHz, 20 Lead LCC	-
C	8406801VA	MD82C84A	SMD - Clock Generator, 8MHz, 20 Lead CDIP	-
C	84069012A	MR82C88	SMD - Bus Controller, 8MHz, 20 Lead LCC	-
C	8406901RA	MD82C88	SMD - Bus Controller, 8MHz, 20 Lead CDIP	-
C	8407001EA	CD54HC75/3A	SMD - Dual Brand CD54HC75/3A	-
C	8407101RA	CD54HC374/3A	SMD - Dual Brand CD54HC374/3A	-
C	8407201RA	CD54HC373/3A	SMD - Dual Brand CD54HC373/3A	-

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	8407301EA	CD54HC174/3A	SMD - Dual Brand CD54HC174/3A	-
C	8407401RA	CD54HC240/3A	SMD - Dual Brand CD54HC240/3A	-
C	8407501EA	CD54HC161/3A	SMD - Dual Brand CD54HC161/3A	-
C	8408501RA	CD54HC245/3A	SMD - Dual Brand CD54HC245/3A	-
C	8408801EA	CD54HC112/3A	SMD - Dual Brand CD54HC112/3A	-
C	8408901EA	CD54HC175/3A	SMD - Dual Brand CD54HC175/3A	-
C	8409001CA	CD54HC243/3A	SMD - Dual Brand CD54HC243/3A	-
C	8409101CA	CD54HC14/3A	SMD - Dual Brand CD54HC14/3A	-
C	8409201EA	CD54HC139/3A	SMD - Dual Brand CD54HC139/3A	-
C	8409301EA	CD54HC153/3A	SMD - Dual Brand CD54HC153/3A	-
C	8409401EA	CD54HC162/3A	SMD - Dual Brand CD54HC162/3A	-
C	8409501EA	CD54HC165/3A	SMD - Dual Brand CD54HC165/3A	-
C	8409601RA	CD54HC244/3A	SMD - Dual Brand CD54HC244/3A	-
C	8409801CA	CD54HC04/3A	SMD - Dual Brand CD54HC04/3A	-
C	8409901RA	CD54HC273/3A	SMD - Dual Brand CD54HC273/3A	-
C	8410001CA	CD54HC393/3A	SMD - Dual Brand CD54HC393/3A	-
C	8412801EA	CD54HC151/3A	SMD - Dual Brand CD54HC151/3A	-
C	8413201RA	HM1-65262/883	SMD - 16384 x 1 RAM DIP Package	-
C	8413201YA	HM4-65262/883	SMD - 16384 x 1 RAM LCC Package	-
C	8413203RA	HM1-65262B	SMD - 16384 x 1 RAM DIP Package	-
C	8413203YA	HM4-65262B/883	SMD - 16384 x 1 RAM LCC Package	-
C	8415001EA	CD54HC109/3A	SMD - Dual Brand CD54HC109/3A	-
C	8416201CA	CD54HC164/3A	SMD - Dual Brand CD54HC164/3A	-
C	8500101EA	CD54HC365/3A	SMD - Dual Brand CD54HC365/3A	-
C	8500201EA	CD54HC367/3A	SMD - Dual Brand CD54HC367/3A	-
C	8500301EA	CD54HC4020/3A	SMD - Dual Brand CD54HC4020/3A	-
C	8500401EA	CD54HC4040/3A	SMD - Dual Brand CD54HC4040/3A	-
C	85015013A	MR82C52	SMD - Serial Comm I/F-28 Lead LCC	-
C	8501501XA	MD82C52	SMD - Serial Comm I/F-20 Lead CDIP	-
C	8512401EA	CD54HC251/3A	SMD - Dual Brand CD54HC257/3A	-
C	8512501EA	CD54HC251/3A	SMD - Dual Brand CD54HC251/3A	-
C	8512801RA	CD54HC573/3A	SMD - Dual Brand CD54HC573/3A	-
C	8513001RA	CD54HCT244/3A	SMD - Dual Brand CD54HCT244/3A	-
C	8550401EA	CD54HCT138/3A	SMD - Dual Brand CD54HCT138/3A	-
C	8550501RA	CD54HCT240/3A	SMD - Dual Brand CD54HCT240/3A	-
C	8550601RA	CD54HCT245/3A	SMD - Dual Brand CD54HCT245/3A	-
C	8550701RA	CD54HCT374/3A	SMD - Dual Brand CD54HCT374/3A	-
C	8551901EA	CD54HC259/3A	SMD - Dual Brand CD54HC259/3A	-
C	8601001CA	CD54HCU04/3A	SMD - Dual Brand CD54HCU04/3A	-
C	8601101EA	CD54HC4017/3A	SMD - Dual Brand CD54HC4017/3A	-
C	8601201CA	CD54HC4024/3A	SMD - Dual Brand CD54HC4024/3A	-
C	8601301EA	CD54HC85/3A	SMD - Dual Brand CD54HC85/3A	-
C	8607601EA	CD54HC163/3A	SMD - Dual Brand CD54HC163/3A	-
C	8607701CA	CD54HC280/3A	SMD - Dual Brand CD54HC280/3A	-
C	87063-001	V22Z05	DESC MOV 22V	-
C	87063-002	V22ZA1	DESC MOV 22V	-
C	87063-003	V22ZA2	DESC MOV 22V	-
C	87063-004	V22ZA3	DESC MOV 22V	-
C	87063-005	V24ZA50	DESC MOV 24V	-
C	87063-006	V27ZA05	DESC MOV 27V	-

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	87063-007	V27ZA1	DESC MOV 27V	-
C	87063-008	V27ZA2	DESC MOV 27V	-
C	87063-009	V27ZA4	DESC MOV 27V	-
C	87063-010	V27ZA60	DESC MOV 27V	-
C	87063-011	V33ZA05	DESC MOV 33V	-
C	87063-012	V33ZA1	DESC MOV 33V	-
C	87063-013	V33ZA2	DESC MOV 33V	-
C	87063-014	V33ZA5	DESC MOV 33V	-
C	87063-015	V33ZA70	DESC MOV 33V	-
C	87063-016	V36ZA80	DESC MOV 36V	-
C	87063-017	V39ZA05	DESC MOV 39V	-
C	87063-018	V39ZA1	DESC MOV 39V	-
C	87063-019	V39ZA3	DESC MOV 39V	-
C	87063-020	V39ZA6	DESC MOV 39V	-
C	87063-021	V47ZA05	DESC MOV 47V	-
C	87063-022	V47ZA1	DESC MOV 47V	-
C	87063-023	V47ZA3	DESC MOV 47V	-
C	87063-024	V47ZA7	DESC MOV 47V	-
C	87063-025	V56ZA05	DESC MOV 56V	-
C	87063-026	V56ZA2	DESC MOV 56V	-
C	87063-027	V56ZA3	DESC MOV 56V	-
C	87063-028	V56ZA8	DESC MOV 56V	-
C	87063-029	V68ZA05	DESC MOV 68V	-
C	87063-030	V68ZA2	DESC MOV 68V	-
C	87063-031	V68ZA3	DESC MOV 68V	-
C	87063-032	V68ZA10	DESC MOV 68V	-
C	87063-033	V82ZA05	DESC MOV 82V	-
C	87063-034	V82ZA2	DESC MOV 82V	-
C	87063-035	V82ZA4	DESC MOV 82V	-
C	87063-036	V82ZA12	DESC MOV 82V	-
C	87063-037	V100ZA05	DESC MOV 100V	-
C	87063-038	V100ZA3	DESC MOV 100V	-
C	87063-039	V100ZA4	DESC MOV 100V	-
C	87063-040	V100ZA15	DESC MOV 100V	-
C	87063-041	V120ZA05	DESC MOV 120V	-
C	87063-042	V120ZA1	DESC MOV 120V	-
C	87063-043	V120ZA4	DESC MOV 120V	-
C	87063-044	V120ZA6	DESC MOV 120V	-
C	87063-045	V150ZA05	DESC MOV 150V	-
C	87063-046	V150ZA1	DESC MOV 150V	-
C	87063-047	V150ZA4	DESC MOV 150V	-
C	87063-048	V150ZA8	DESC MOV 150V	-
C	87063-049	V180ZA05	DESC MOV 180V	-
C	87063-050	V180ZA1	DESC MOV 180V	-
C	87063-051	V180ZA5	DESC MOV 180V	-
C	87063-052	V180ZA10	DESC MOV 180V	-
C	89007-2N7123TX		Power MOS 100V, 38A, 0.055W, 150W TO-204AE	-
C	89007-2N7123TXV		Power MOS 100V, 38A, 0.055W, 150W TO-204AE	-
C	89007-2N7124TX		Power MOS 200V, 30A, 0.085W, 150W, TO-204AE	-
C	89007-2N7124TXV		Power MOS 200V, 30A, 0.085W, 150W TO-204AE	-

See Section 1 for complete selection guide, page number reference, and file number listing.

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	89007-2N7125TX		Power MOS 400V, 14A, 00Ω, 150W TO-204AA	-
C	89007-2N7125TXV		Power MOS 400V, 14A, 00Ω, 150W TO-204AA	-
C	89007-2N7126TX		Power MOS 500V, 12A, 0.40Ω, 150W TO-204AA	-
C	89007-2N7126TXV		Power MOS 500V, 12A, 0.40Ω, 150W TO-204AA	-
C	89009-2N7119TX		Power MOS 100V, 14A, 08Ω, 75W TO-24AA	-
C	89009-2N7119TXV		Power MOS 100V, 14A, 08Ω, 75W TO-204AA	-
C	89009-2N7120TX		Power MOS 200V, 9A, 0.40Ω, 75W TO-204AA	-
C	89009-2N7120TXV		Power MOS 200V, 9A, 0.40Ω, 75W TO-204AA	-
C	89009-2N7121TX		Power MOS 400V, 5A, 1.0Ω, 75W TO-204AA	-
C	89009-2N7121TXV		Power MOS 400V, 5A, 1.0Ω, 75W TO-204AA	-
C	89009-2N7122TX		Power MOS 500V, 4A, 1Ω, 75W TO-204AA	-
C	89009-2N7122TXV		Power MOS 500V, 4A, 1Ω, 75W TO-204AA	-
C	89025-2N7241TX		Power MOS 100V, 14A, 095Ω, 75W TO-254AA	-
C	89025-2N7241TXV		Power MOS 100V, 14A, 095Ω, 75W TO-254AA	-
C	89025-2N7242TX		Power MOS 200V, 9A, 0.415Ω, 75W TO-254AA	-
C	89025-2N7242TXV		Power MOS 200V, 9A, 0.415Ω, 75W TO-254AA	-
C	89025-2N7243TX		Power MOS 400V, 5A, 1.0Ω, 75W TO-254AA	-
C	89025-2N7243TXV		Power MOS 400V, 5A, 1.0Ω, 75W TO-254AA	-
C	89025-2N7244TX		Power MOS 500V, 4A, 1Ω, 75W TO-254AA	-
C	89025-2N7244TXV		Power MOS 500V, 4A, 1Ω, 75W TO-254AA	-
C	90065-012	V131DB40	DESC MOV 40mm DA/DB	-
C	90065-013	V151DB40	DESC MOV 40mm DA/DB	-
C	90065-014	V251DB40	DESC MOV 40mm DA/DB	-
C	90065-015	V271DB40	DESC MOV 40mm DA/DB	-
C	90065-016	V321DB40	DESC MOV 40mm DA/DB	-
C	90065-017	V421DB40	DESC MOV 40mm DA/DB	-
C	90065-018	V481DB40	DESC MOV 40mm DA/DB	-
C	90065-019	V511DB40	DESC MOV 40mm DA/DB	-
C	90065-020	V571DB40	DESC MOV 40mm DA/DB	-
C	90065-021	V661DB40	DESC MOV 40mm DA/DB	-
C	90065-022	V751DB40	DESC MOV 40mm DA/DB	-
N	ACS00DMSR		Rad Hard Quad 2-Input NAND Gate	3563
N	ACS00KMSR		Rad Hard Quad 2-Input NAND Gate	3563
N	ACS03DMSR		Rad Hard Quad 2-Input NAND Gate with Open Drain	3064
N	ACS03KMSR		Rad Hard Quad 2-Input NAND Gate with Open Drain	3064
N	ACS08DMSR		Rad Hard Quad 2-Input AND Gate	-
N	ACS08KMSR		Rad Hard Quad 2-Input AND Gate	-
N	ACS10DMSR		Rad Hard Triple 3-Input NAND Gate	3630
N	ACS10KMSR		Rad Hard Triple 3-Input NAND Gate	3630
N	ACS112DMSR		Rad Hard Dual J-K Flip-Flop w/Set & Reset, Negative Edge Trigger	3571
N	ACS112KMSR		Rad Hard Dual J-K Flip-Flop w/Set & Reset, Negative Edge Trigger	3571
N	ACS125DMSR		Rad Hard Quad Buffer, Three-State	3565
N	ACS125KMSR		Rad Hard Quad Buffer, Three-State	3565
N	ACS161DMSR		Rad Hard Synchronous 4-Bit Binary Counter, Asynchronous Reset	3600
N	ACS161KMSR		Rad Hard Synchronous 4-Bit Binary Counter, Asynchronous Reset	3600
N	ACS20DMSR		Rad Hard Dual 4-Input NAND Gate	3616

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PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	ACS20KMSR		Rad Hard Dual 4-Input NAND Gate	3616
N	ACS245DMSR		Rad Hard Octal Bus Transceiver, Three-State	3198
N	ACS245KMSR		Rad Hard Octal Bus Transceiver, Three-State	3198
N	ACS280DMSR		Rad Hard 9-Bit Odd/Even Parity Generator Checker	3568
N	ACS280KMSR		Rad Hard 9-Bit Odd/Even Parity Generator Checker	3568
N	ACS373DMSR		Rad Hard Octal Transparent Latch, Three-State	3999
N	ACS373KMSR		Rad Hard Octal Transparent Latch, Three-State	3999
N	ACS374DMSR		Rad Hard Octal D Flip-Flop, Positive Edge Trigger	3997
N	ACS374KMSR		Rad Hard Octal D Flip-Flop, Positive Edge Trigger	3997
N	ACS521DMSR		Rad Hard 8-Bit Identity Comparator	3111
N	ACS521KMSR		Rad Hard 8-Bit Identity Comparator	3111
N	ACS541DMSR		Rad Hard Octal Three-State Buffer/Line Driver	-
N	ACS541KMSR		Rad Hard Octal Three-State Buffer/Line Driver	-
N	ACS573DMSR		Rad Hard Octal Transparent Latch, Three-State	-
N	ACS573KMSR		Rad Hard Octal Transparent Latch, Three-State	-
N	ACS630DMSR		Rad Hard 16-Bit Parallel EDAC	3199
N	ACS630KMSR		Rad Hard 16-Bit Parallel EDAC	3199
N	ACS74DMSR		Rad Hard Dual-D Flip-Flop w/Set & Reset, Positive Edge Trigger	-
N	ACS74KMSR		Rad Hard Dual-D Flip-Flop w/Set & Reset, Positive Edge Trigger	-
N	ACS86DMSR		Rad Hard Quad 2-Input Exclusive OR Gate	3995
N	ACS86KMSR		Rad Hard Quad 2-Input Exclusive OR Gate	3995
N	ACTS00DMSR		Rad Hard Quad 2-Input NAND Gate	3564
N	ACTS00KMSR		Rad Hard Quad 2-Input NAND Gate	3564
N	ACTS04DMSR		Rad Hard Hex Inverter	3383
N	ACTS04KMSR		Rad Hard Hex Inverter	3383
N	ACTS08DMSR		Rad Hard Quad 2-Input AND Gate	3994
N	ACTS08KMSR		Rad Hard Quad 2-Input AND Gate	3994
N	ACTS10DMSR		Rad Hard Triple 3-Input NAND Gate	3631
N	ACTS10KMSR		Rad Hard Triple 3-Input NAND Gate	3631
N	ACTS112DMSR		Rad Hard J-K Flip-Flop	3570
N	ACTS112KMSR		Rad Hard J-K Flip-Flop	3570
N	ACTS125DMSR		Rad Hard Quad Buffer, Three-State	3566
N	ACTS125KMSR		Rad Hard Quad Buffer, Three-State	3566
N	ACTS161DMSR		Rad Hard Synchronous 4-Bit Binary Counter, Asynchronous Reset	-
N	ACTS161KMSR		Rad Hard Synchronous 4-Bit Binary Counter, Asynchronous Reset	-
N	ACTS20DMSR		Rad Hard Dual 4-Input NAND Gate	3611
N	ACTS20KMSR		Rad Hard Dual 4-Input NAND Gate	3611
N	ACTS240DMSR		Rad Hard Octal Buffer/Line Driver, Three-State, Inverting	3186
N	ACTS240KMSR		Rad Hard Octal Buffer/Line Driver, Three-State, Inverting	3186
N	ACTS244DMSR		Rad Hard Octal Buffer/Line Driver, Three-State	3187
N	ACTS244KMSR		Rad Hard Octal Buffer/Line Driver, Three-State	3187
N	ACTS245DMSR		Rad Hard Octal Bus Transceiver, Three-State	3188
N	ACTS245KMSR		Rad Hard Octal Bus Transceiver, Three-State	3188
N	ACTS280DMSR		Rad Hard 9-Bit Odd/Even Parity Generator Checker	3569
N	ACTS280KMSR		Rad Hard 9-Bit Odd/Even Parity Generator Checker	3569
N	ACTS373DMSR		Rad Hard Octal Transparent Latch, Three-State	3994

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	ACTS373KMSR		Rad Hard Octal Transparent Latch, Three-State	4000
N	ACTS374DMSR		Rad Hard Octal D Flip-Flop, Positive Edge Trigger	3998
N	ACTS374KMSR		Rad Hard Octal D Flip-Flop, Positive Edge Trigger	3998
N	ACTS541DMSR		Rad Hard Octal Three-State Buffer/Line Driver	-
N	ACTS541KMSR		Rad Hard Octal Three-State Buffer/Line Driver	-
N	ACTS573DMSR		Rad Hard Octal Transparent Latch, Three-State	-
N	ACTS573KMSR		Rad Hard Octal Transparent Latch, Three-State	-
N	ACTS630DMSR		Rad Hard 16-Bit Parallel EDAC	3204
N	ACTS630KMSR		Rad Hard 16-Bit Parallel EDAC	3204
N	ACTS74DMSR		Rad Hard Dual-D Flip-Flop w/Set and Reset, Positive Edge Trigger	3382
N	ACTS74KMSR		Rad Hard Dual-D Flip-Flop w/Set and Reset, Positive Edge Trigger	3382
N	ACTS86DMSR		Rad Hard Quad 2-Input Exclusive OR Gate	3996
N	ACTS86KMSR		Rad Hard Quad 2-Input Exclusive OR Gate	3996
C	AD7520SD/883B		M-DAC, 10-Bit I-Out, 8-Bit Lin, 16 Lead CDIP	3104
C	AD7520UD/883B		M-DAC, 10-Bit I-Out,10-Bit Lin, 6 Lead CDIP	3104
N	CA0741S3		Op Amp, Single, Formed Leads	531
N	CA0741T3		Op Amp, Single, Internal Compensation	531
N	CA3018A3		Transistor Array, General Purpose	338
N	CA30263		Differential Amp, Dual Independent	-
N	CA3028A3		Differential Amp, Differential/Cascade	-
N	CA3028B3		Differential Amp, Differential/Cascade	-
N	CA30393		Diode Array - 6 Ultra Fast	343
N	CA30453		Transistor Array, General Purpose	341
N	CA3045F3		Transistor Array, General Purpose	341
N	CA3049T3		Differential Amp, Dual High Frequency	611
N	CA3080A3		OTA Gateable Gain Blocks	475
N	CA3080AS3		OTA Gateable Gain Blocks, Formed Leads	475
N	CA3081F3		Transistor Array, High Current NPN	480
N	CA3083F3W		Transistor Array, NPN	481
N	CA3085A3		Positive Voltage Regulator	491
N	CA3085AS3		Positive Voltage Regulator, Formed Leads	491
N	CA3085BS3		Positive Voltage Regulator, Formed Leads	491
N	CA3085BT3		Positive Voltage Regulator	491
N	CA3089F3W		FM IF System	-
N	CA3094AS3		Programmable Power/Switch Amp, Formed Leads	598
N	CA3094AT3		Programmable Power/Switch Amp	598
N	CA3094S3		Programmable Power/Switch Amp, Formed Leads	598
N	CA3094T3		Programmable Power/Switch Amp	598
N	CA3100S3		Wide Band Op Amp, Formed Leads	625
N	CA3100T3		Wide Band Op Amp	625
N	CA3130AS3		BiMOS Op Amp, Formed Leads	817
N	CA3130AT3		BiMOS Op Amp, CMOS Output	817
N	CA3130S3		BiMOS Op Amp, Formed Leads	817
N	CA3130T3		BiMOS Op Amp, CMOS Output	817
N	CA3140AS3		BiMOS Op Amp, Formed Leads	957
N	CA3140AT3		Op Amp, General Purpose, Single	957
N	CA3140S3		Op Amp, General Purpose, Single, Formed Leads	957
N	CA3140T3		Op Amp, General Purpose, Single, BiMOS	957

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	CA3160AS3		Op Amp, General Purpose, Formed Leads	976
N	CA3160AT3		Op Amp, General Purpose, Single	976
N	CA3160T3		Op Amp, General Purpose, Single, BiMOS	976
N	CA3260AT3		Op Amp, Wideband, Dual, High Slew Rate	1266
N	CA3260T3		Op Amp, Wideband, Dual, High Slew Rate	1266
N	CA3280AF3		Op Amp, Wideband, Dual, High Slew Rate	1174
N	CA3290AT3		Comparator, Dual Voltage, General Purpose	1049
N	CA3306AD3		Flash A/D - 18 CDIP 6-Bit 15 MSPS	3102
N	CA3306CD3		Flash A/D - 18 Side Brazed DIP 6-Bit 10 MSPS	3102
N	CA3306CJ3		Flash A/D - 20 LCC 6-Bit 10 MSPS	3102
N	CA3306D3		Flash A/D - 18 Side Brazed DIP 6-Bit 15 MSPS	3102
N	CA3306J3		Flash A/D - 20 LCC 6-Bit 15 MSPS	3102
N	CD14538BD3		Dual Precision Monostable Multivibrator	7012
N	CD14538BDMSH		Rad Hard Dual Precision Monostable Multivibrator	3192
N	CD14538BDMSR		Rad Hard Dual Precision Monostable Multivibrator	3192
C	CD14538B/3A	5962-9055701EA	Dual Precision Monostable Multivibrator	7012
N	CD14538BFMSH		Rad Hard Dual Precision Monostable Multivibrator	3192
N	CD14538BFMSR		Rad Hard Dual Precision Monostable Multivibrator	3192
N	CD14538BKMSH		Rad Hard Dual Precision Monostable Multivibrator	3192
N	CD14538BKMSR		Rad Hard Dual Precision Monostable Multivibrator	3192
C	CD4000AFB	JM38510/05201BCA	Dual 3-Input NOR Gate Plus Inverter	Note 1
N	CD4000BDMSH		Dual 3-Input NOR Gate Plus Inverter, Rad Hard	3289
N	CD4000BDMSR		Dual 3-Input NOR Gate Plus Inverter, Rad Hard	3289
N	CD4000BFMSH		Dual 3-Input NOR Gate Plus Inverter, Rad Hard	3289
N	CD4000BFMSR		Dual 3-Input NOR Gate Plus Inverter, Rad Hard	3289
N	CD4000BKMSH		Dual 3-Input NOR Gate Plus Inverter, Rad Hard	3289
N	CD4000BKMSR		Dual 3-Input NOR Gate Plus Inverter, Rad Hard	3289
N	CD4001AD3		Quad 2-Input NOR Gate	7012
C	CD4001AFB	JM38510/05202BCA	Quad 2-Input NOR Gate	Note 1
N	CD4001AK3		Quad 2-Input NOR Gate, Weldseal Flatpack	7012
N	CD4001BD3		Quad 2-Input NOR Gate, Weldseal DIC	7012
N	CD4001BDMSH		Quad 2-Input NOR Gate, Rad Hard	3289
N	CD4001BDMSR		Quad 2-Input NOR Gate, Rad Hard	3289
C	CD4001B/3A		Quad 2-Input NOR Gate	7012
C	CD4001BFB	JM38510/05252BCA	Quad 2-Input NOR Gate	Note 1
C	CD4001BFBH	JM38510H05252BCA	Quad 2-Input NOR Gate, Rad Hard	Note 1
C	CD4001BFBR	JM38510R05252BCA	Quad 2-Input NOR Gate, Rad Hard	Note 1
N	CD4001BFMSH		Quad 2-Input NOR Gate, Rad Hard	3289
N	CD4001BFMSR		Quad 2-Input NOR Gate, Rad Hard	3289
C	CD4001BFSH	JM38510H05252SCA	Quad 2-Input NOR Gate, Rad Hard	Note 1
C	CD4001BFSR	JM38510R05252SCA	Quad 2-Input NOR Gate, Rad Hard	Note 1
N	CD4001BK3		Quad 2-Input NOR Gate, Weldseal Field Programmable	7012
N	CD4001BKMSH		Quad 2-Input NOR Gate, Rad Hard	3289
N	CD4001BKMSR		Quad 2-Input NOR Gate, Rad Hard	3289
C	CD4001BQBH	JM38510H05252BTC	Quad 2-Input NOR Gate, Rad Hard	7012
C	CD4001BQBR	JM38510R05252BTC	Quad 2-Input NOR Gate, Rad Hard	7012
C	CD4001BQSH	JM38510H05252STC	Quad 2-Input NOR Gate, Rad Hard	7012
C	CD4001BQSR	JM38510R05252STC	Quad 2-Input NOR Gate, Rad Hard	7012
C	CD4001UB/3A		Quad 2-Input NOR Gate, Unbuffered	7012
N	CD4002BDMSH		Dual 4-Input NOR Gate, Rad Hard	3289

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	CD4002BDMSR		Dual 4-Input NOR Gate, Rad Hard	3289
C	CD4002B/3A	7704403CA	Dual 4-Input NOR Gate, Dual Brand	7012
C	CD4002BFBR	JM38510R05253BCA	Dual 4-Input NOR Gate, Rad Hard	7012
N	CD4002BFMSH		Dual 4-Input NOR Gate, Rad Hard	3289
N	CD4002BFMSR		Dual 4-Input NOR Gate, Rad Hard	3289
C	CD4002BFSR	JM38510R05253SCA	Dual 4-Input NOR Gate, Rad Hard	Note 1
N	CD4002BK3		Dual 4-Input NOR Gate, Weldseal Field Programmable	7012
N	CD4002BKMSH		Dual 4-Input NOR Gate, Rad Hard	3289
N	CD4002BKMSR		Dual 4-Input NOR Gate, Rad Hard	3289
C	CD4002BQBR	JM38510R05253BTC	Dual 4-Input NOR Gate, Rad Hard	Note 1
C	CD4002BQSR	JM38510R05253STC	Dual 4-Input NOR Gate, Rad Hard	Note 1
N	CD4006BDMSH		18-Stage Static Shift Register, Rad Hard	3290
N	CD4006BDMSR		18-Stage Static Shift Register, Rad Hard	3290
C	CD4006B/3A		18-Stage Static Shift Register	7012
N	CD4006BFMSH		18-Stage Static Shift Register, Rad Hard	3290
N	CD4006BFMSR		18-Stage Static Shift Register, Rad Hard	3290
N	CD4006BKMSH		18-Stage Static Shift Register, Rad Hard	3290
N	CD4006BKMSR		18-Stage Static Shift Register, Rad Hard	3290
N	CD4007AD3		18-Stage Static Shift Register, Weldseal DIC	7012
N	CD4007UBDMSH		Dual Complementary Pair Plus Inverter, Rad Hard	3291
N	CD4007UBDMSR		Dual Complementary Pair Plus Inverter, Rad Hard	3291
C	CD4007UB/3A		Dual Complementary Pair Plus Inverter, Unbuffered	7012
C	CD4007UBFBH	JM38510H05351BCA	Dual Complementary Pair Plus Inverter, Rad Hard	Note 1
C	CD4007UBFBR	JM38510R05351BCA	Dual Complementary Pair Plus Inverter, Rad Hard	Note 1
N	CD4007UBFMSR		Dual Complementary Pair Plus Inverter, Rad Hard	3291
C	CD4007UBFSH	JM38510H05351SCA	Dual Complementary Pair Plus Inverter, Rad Hard	Note 1
C	CD4007UBFSR	JM38510R05351SCA	Dual Complementary Pair Plus Inverter, Rad Hard	Note 1
N	CD4007UBKMSH		Dual Complementary Pair Plus Inverter, Rad Hard	3291
N	CD4007UBKMSR		Dual Complementary Pair Plus Inverter, Rad Hard	3291
C	CD4007UBQBH	JM38510H05351BTC	Dual Complementary Pair Plus Inverter, Rad Hard	Note 1
C	CD4007UBQBR	JM38510R05351BTC	Dual Complementary Pair Plus Inverter, Rad Hard	Note 1
C	CD4007UBQSH	JM38510H05351STC	Dual Complementary Pair Plus Inverter, Rad Hard	Note 1
C	CD4007UBQSR	JM38510R05351STC	Dual Complementary Pair Plus Inverter, Rad Hard	Note 1
N	CD4008BDMSH		4-Bit Full Adder with Parallel Carry-Out, Rad Hard	3292
N	CD4008BDMSR		4-Bit Full Adder with Parallel Carry-Out, Rad Hard	3292
C	CD4008B/3A		4-Bit Full Adder with Parallel Carry-Out	7012
C	CD4008BFBR	JM38510R05451BEA	4-Bit Full Adder with Parallel Carry-Out, Rad Hard	Note 1
N	CD4008BFMSH		4-Bit Full Adder with Parallel Carry-Out, Rad Hard	3292
N	CD4008BFMSR		4-Bit Full Adder with Parallel Carry-Out, Rad Hard	3292
C	CD4008BFSR	JM38510R05451SEA	4-Bit Full Adder with Parallel Carry-Out, Rad Hard	Note 1
N	CD4008BKMSH		4-Bit Full Adder with Parallel Carry-Out, Rad Hard	3292
N	CD4008BKMSR		4-Bit Full Adder with Parallel Carry-Out, Rad Hard	3292
C	CD4008BQBR	JM38510R05451BNC	4-Bit Full Adder with Parallel Carry-Out, Rad Hard	Note 1
C	CD4008BQSR	JM38510R05451SNC	4-Bit Full Adder with Parallel Carry-Out, Rad Hard	Note 1
N	CD4009UBD3		Hex Buffer/Converter, Inverting, Weldseal DIC	7012
N	CD4009UBDMSH		Hex Buffer/Converter, Inverting, Rad Hard	3293
N	CD4009UBDMSR		Hex Buffer/Converter, Inverting, Rad Hard	3293
C	CD4009UB/3A		Hex Buffer/Converter, Unbuffered	7012
N	CD4009UBFMSH		Hex Buffer/Converter, Inverting, Rad Hard	3293
N	CD4009UBFMSR		Hex Buffer/Converter, Inverting, Rad Hard	3293

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	CD4009UBK3		Hex Buffer/Converter, Inverting, Field Programmable	7012
N	CD4009UBKMSH		Hex Buffer/Converter, Inverting, Rad Hard	3293
N	CD4009UBKMSR		Hex Buffer/Converter, Inverting, Rad Hard	3293
N	CD40100BDMSH		9-Bit Parity Generator/Checker, Rad Hard	3349
N	CD40100BDMSR		9-Bit Parity Generator/Checker, Rad Hard	3349
N	CD40100BFMSH		9-Bit Parity Generator/Checker, Rad Hard	3349
N	CD40100BFMSR		9-Bit Parity Generator/Checker, Rad Hard	3349
N	CD40100BKMSH		9-Bit Parity Generator/Checker, Rad Hard	3349
N	CD40100BKMSR		9-Bit Parity Generator/Checker, Rad Hard	3349
N	CD40101BDMSH		9-Bit Parity Generator/Checker, Rad Hard	3350
N	CD40101BDMSR		9-Bit Parity Generator/Checker, Rad Hard	3350
C	CD40101B/3A		9-Bit Parity Generator/Checker	7012
N	CD40101BFMSH		9-Bit Parity Generator/Checker, Rad Hard	3350
N	CD40101BFMSR		9-Bit Parity Generator/Checker, Rad Hard	3350
N	CD40101BKMSH		9-Bit Parity Generator/Checker, Rad Hard	3350
N	CD40101BKMSR		9-Bit Parity Generator/Checker, Rad Hard	3350
N	CD40102BDMSH		Presettable 2-Decade BCD Down Counter, Rad Hard	3351
N	CD40102BDMSR		Presettable 2-Decade BCD Down Counter, Rad Hard	3351
N	CD40102BFMSH		Presettable 2-Decade BCD Down Counter, Rad Hard	3351
N	CD40102BFMSR		Presettable 2-Decade BCD Down Counter, Rad Hard	3351
N	CD40102BKMSH		Presettable 2-Decade BCD Down Counter, Rad Hard	3351
N	CD40102BKMSR		Presettable 2-Decade BCD Down Counter, Rad Hard	3351
N	CD40103BDMSH		Presettable 8-Bit Binary Down Counter, Rad Hard	3351
N	CD40103BDMSR		Presettable 8-Bit Binary Down Counter, Rad Hard	3351
C	CD40103B/3A		Presettable 8-Bit Binary Down Counter	7012
N	CD40103BFMSH		Presettable 8-Bit Binary Down Counter, Rad Hard	3351
N	CD40103BFMSR		Presettable 8-Bit Binary Down Counter, Rad Hard	3351
N	CD40103BKMSH		Presettable 8-Bit Binary Down Counter, Rad Hard	3351
N	CD40103BKMSR		Presettable 8-Bit Binary Down Counter, Rad Hard	3351
N	CD40104BDMSH		4-Bit Bidirectional Universal Shift Register, Rad Hard	3352
N	CD40104BDMSR		4-Bit Bidirectional Universal Shift Register, Rad Hard	3352
N	CD40104BFMSH		4-Bit Bidirectional Universal Shift Register, Rad Hard	3352
N	CD40104BKMSH		4-Bit Bidirectional Universal Shift Register, Rad Hard	3352
N	CD40104BKMSR		4-Bit Bidirectional Universal Shift Register, Rad Hard	3352
N	CD40105BDMSH		4-Bit x 16 Word FIFO Buffer Register, Rad Hard	3353
N	CD40105BDMSR		4-Bit x 16 Word FIFO Buffer Register, Rad Hard	3353
C	CD40105B/3A		4-Bit x 16 Word FIFO Buffer Register	7012
N	CD40105BFMSH		4-Bit x 16 Word FIFO Buffer Register, Rad Hard	3353
N	CD40105BFMSR		4-Bit x 16 Word FIFO Buffer Register, Rad Hard	3353
N	CD40105BK3		4-Bit x 16 Word FIFO Buffer Register, Field Programmable	7012
N	CD40105BKMSH		4-Bit x 16 Word FIFO Buffer Register, Rad Hard	3353
N	CD40105BKMSR		4-Bit x 16 Word FIFO Buffer Register, Rad Hard	3353
N	CD40106BDMSH		Hex Schmitt Trigger, Rad Hard	3354
N	CD40106BDMSR		Hex Schmitt Trigger, Rad Hard	3354
C	CD40106B/3A		Hex Schmitt Trigger	7012
N	CD40106BFMSH		Hex Schmitt Trigger, Rad Hard	3354
N	CD40106BFMSR		Hex Schmitt Trigger, Rad Hard	3354
N	CD40106BK3		Hex Schmitt Trigger, Weldseal Flatpack	7012
N	CD40106BKMSH		Hex Schmitt Trigger, Rad Hard	3354
N	CD40106BKMSR		Hex Schmitt Trigger, Rad Hard	3354

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	CD40107BDMSH		Dual 2-Input NAND Buffer/Driver, Rad Hard	3355
N	CD40107BDMSR		Dual 2-Input NAND Buffer/Driver, Rad Hard	3355
C	CD40107B/3A		Dual 2-Input NAND Buffer/Driver	7012
N	CD40107BFMSH		Dual 2-Input NAND Buffer/Driver, Rad Hard	3355
N	CD40107BFMSR		Dual 2-Input NAND Buffer/Driver, Rad Hard	3355
N	CD40107BKMSH		Dual 2-Input NAND Buffer/Driver, Rad Hard	3355
N	CD40107BKMSR		Dual 2-Input NAND Buffer/Driver, Rad Hard	3355
N	CD40108BD3		4 x 4 Multiport Register, Weldseal DIC	7012
N	CD40108BDMSH		4 x 4 Multiport Register, Rad Hard	3356
N	CD40108BDMSR		4 x 4 Multiport Register, Rad Hard	3356
N	CD40108BKMSH		4 x 4 Multiport Register, Rad Hard	3356
N	CD40108BKMSR		4 x 4 Multiport Register, Rad Hard	3356
N	CD40109BDMSH		Quad Low-to-High Voltage Interface, Rad Hard	3196
N	CD40109BDMSR		Quad Low-to-High Voltage Interface, Rad Hard	3196
N	CD40109BDMSR		Quad Low-to-High Voltage Interface, Rad Hard	3196
C	CD40109B/3A		Quad Low-to-High Voltage Interface	7012
N	CD40109BFMSH		Quad Low-to-High Voltage Interface, Rad Hard	3196
N	CD40109BFMSR		Quad Low-to-High Voltage Interface, Rad Hard	3196
N	CD40109BK3		Quad Low-to-High Voltage Interface Field Programmable	7012
N	CD40109BKMSH		Quad Low-to-High Voltage Interface, Rad Hard	3196
N	CD40109BKMSR		Quad Low-to-High Voltage Interface, Rad Hard	3196
N	CD4010BDMSH		Hex Buffer/Converter, Non-Inverting, Rad Hard	3078
N	CD4010BDMSR		Hex Buffer/Converter, Non-Inverting, Rad Hard	3078
C	CD4010B/3A		Hex Buffer/Converter, Non-Inverting	7012
N	CD4010BFMSH		Hex Buffer/Converter, Non-Inverting, Rad Hard	3078
N	CD4010BFMSR		Hex Buffer/Converter, Non-Inverting, Rad Hard	3078
N	CD4010BK3		Hex Buffer/Converter, Non-Inverting Field Programmable	7012
N	CD4010BKMSH		Hex Buffer/Converter, Non-Inverting, Rad Hard	3078
N	CD4010BKMSR		Hex Buffer/Converter, Non-Inverting, Rad Hard	3078
N	CD40110BDMSH		Decade Up/Down Counter/Decoder/Latch Display Driver Rad Hard	-
N	CD40110BDMSR		Decade Up/Down Counter/Decoder/Latch Display Driver Rad Hard	-
N	CD40110BFMSH		Decade Up/Down Counter/Decoder/Latch Display Driver Rad Hard	-
N	CD40110BFMSR		Decade Up/Down Counter/Decoder/Latch Display Driver Rad Hard	-
N	CD40110BKMSH		Decade Up/Down Counter/Decoder/Latch Display Driver Rad Hard	-
N	CD40110BKMSR		Decade Up/Down Counter/Decoder/Latch Display Driver Rad Hard	-
N	CD40116D3		8-Bit Bidirectional CMOS To TTL Level Interface	7012
N	CD4011AD3		Quad 2-Input NAND Gate, Weldseal DIC	7012
C	CD4011AFB	JM38510/05001BCA	Quad 2-Input NAND Gate	Note 1
N	CD4011AK3		Quad 2-Input NAND Gate, Weldseal FP, Field Programmable	7012
N	CD4011BD3		Quad 2-Input NAND Gate, Weldseal DIC	7012
N	CD4011BDMSH		Quad 2-Input NAND Gate, Rad Hard	3079
N	CD4011BDMSR		Quad 2-Input NAND Gate, Rad Hard	3079
C	CD4011B/3A		Quad 2-Input NAND Gate	7012
C	CD4011BFB	JM38510/05051BCA	Quad 2-Input NAND Gate	Note 1

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	CD4011BFBH	JM38510H05051BCA	Quad 2-Input NAND Gate, Rad Hard	Note 1
C	CD4011BFBR	JM38510R05051BCA	Quad 2-Input NAND Gate, Rad Hard	Note 1
N	CD4011BFMSH		Quad 2-Input NAND Gate, Rad Hard	3079
N	CD4011BFMSR		Quad 2-Input NAND Gate, Rad Hard	3079
C	CD4011BFSH	JM38510H05051SCA	Quad 2-Input NAND Gate, Rad Hard	Note 1
C	CD4011BFSR	JM38510R05051SCA	Quad 2-Input NAND Gate, Rad Hard	Note 1
N	CD4011BK3		Quad 2-Input NAND Gate, Weldseal Flatpack	7012
N	CD4011BKMSH		Quad 2-Input NAND Gate, Rad Hard	3079
N	CD4011BKMSR		Quad 2-Input NAND Gate, Rad Hard	3079
C	CD4011BQBH	JM38510H05051BTC	Quad 2-Input NAND Gate, Rad Hard	Note 1
C	CD4011BQBR	JM38510R05051BTC	Quad 2-Input NAND Gate, Rad Hard	Note 1
C	CD4011BQSH	JM38510H05051STC	Quad 2-Input NAND Gate, Rad Hard	Note 1
C	CD4011BQSR	JM38510R05051STC	Quad 2-Input NAND Gate, Rad Hard	Note 1
C	CD4011UB/3A		Quad 2-Input NAND Gate	7012
N	CD4012AD3		Dual 4-Input NAND Gate, Weldseal DIC	7012
N	CD4012BDMSH		Dual 4-Input NAND Gate, Rad Hard	3079
N	CD4012BDMSR		Dual 4-Input NAND Gate, Rad Hard	3079
C	CD4012B/3A		Dual 4-Input NAND Gate	7012
C	CD4012BFB	JM38510/05052BCA	Dual 4-Input NAND Gate	Note 1
C	CD4012BFBH	JM38510H05052BCA	Dual 4-Input NAND Gate, Rad Hard	Note 1
C	CD4012BFBR	JM38510R05052BCA	Dual 4-Input NAND Gate, Rad Hard	Note 1
N	CD4012BFMSH		Dual 4-Input NAND Gate, Rad Hard	3079
N	CD4012BFMSR		Dual 4-Input NAND Gate, Rad Hard	3079
C	CD4012BFSH	JM38510H05052SCA	Dual 4-Input NAND Gate, Rad Hard	Note 1
C	CD4012BFSR	JM38510R05052SCA	Dual 4-Input NAND Gate, Rad Hard	Note 1
N	CD4012BKMSH		Dual 4-Input NAND Gate, Rad Hard	3079
N	CD4012BKMSR		Dual 4-Input NAND Gate, Rad Hard	3079
C	CD4012BQBH	JM38510H05052BTC	Dual 4-Input NAND Gate, Rad Hard	Note 1
C	CD4012BQBR	JM38510R05052BTC	Dual 4-Input NAND Gate, Rad Hard	Note 1
C	CD4012BQSH	JM38510H05052STC	Dual 4-Input NAND Gate, Rad Hard	Note 1
C	CD4012BQSR	JM38510R05052STC	Dual 4-Input NAND Gate, Rad Hard	Note 1
N	CD4013AD3		Dual D Flip-Flop with Set/Reset Capability	7012
C	CD4013AFB	JM38510/05101BCA	Dual D Flip-Flop with Set/Reset Capability	Note 1
N	CD4013AK3		Dual D Flip-Flop with Set/Reset Capability	7012
N	CD4013BD3		Dual D Flip-Flop with Set/Reset Capability	7012
N	CD4013BDMSH		Dual D Flip-Flop with Set/Reset Capability, Rad Hard	3080
N	CD4013BDMSR		Dual D Flip-Flop with Set/Reset Capability, Rad Hard	3080
C	CD4013B/3A		Dual D Flip-Flop with Set/Reset Capability	7012
C	CD4013BFB	JM38510/05151BCA	Dual D Flip-Flop with Set/Reset Capability	Note 1
C	CD4013BFBH	JM38510H05151BCA	Dual D Flip-Flop with Set/Reset Capability, Rad Hard	Note 1
C	CD4013BFBR	JM38510R05151BCA	Dual D Flip-Flop with Set/Reset Capability, Rad Hard	Note 1
N	CD4013BFMSH		Dual D Flip-Flop with Set/Reset Capability, Rad Hard	3080
N	CD4013BFMSR		Dual D Flip-Flop with Set/Reset Capability, Rad Hard	3080
C	CD4013BFSH	JM38510H05151SCA	Dual D Flip-Flop with Set/Reset Capability, Rad Hard	Note 1
C	CD4013BFSR	JM38510R05151SCA	Dual D Flip-Flop with Set/Reset Capability, Rad Hard	Note 1
N	CD4013BK3		Dual D Flip-Flop with Set/Reset Capability	7012
N	CD4013BKMSH		Dual D Flip-Flop with Set/Reset Capability, Rad Hard	3080
N	CD4013BKMSR		Dual D Flip-Flop with Set/Reset Capability, Rad Hard	3080
C	CD4013BQBH	JM38510H05151BTC	Dual D Flip-Flop with Set/Reset Capability, Rad Hard	Note 1
C	CD4013BQBR	JM38510R05151BTC	Dual D Flip-Flop with Set/Reset Capability, Rad Hard	Note 1

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	CD4013BQSH	JM38510H05151STC	Dual D Flip-Flop with Set/Reset Capability, Rad Hard	Note 1
C	CD4013BQSR	JM38510R05151STC	Dual D Flip-Flop with Set/Reset Capability, Rad Hard	Note 1
N	CD40147BDMSH		10-Line To 4-Line BCD Priority Encoder, Rad Hard	3357
N	CD40147BDMSR		10-Line To 4-Line BCD Priority Encoder, Rad Hard	3357
N	CD40147BFMSH		10-Line To 4-Line BCD Priority Encoder, Rad Hard	3357
N	CD40147BFMSR		10-Line To 4-Line BCD Priority Encoder, Rad Hard	3357
N	CD40147BKMSH		10-Line To 4-Line BCD Priority Encoder, Rad Hard	3357
N	CD40147BKMSR		10-Line To 4-Line BCD Priority Encoder, Rad Hard	3357
N	CD4014AD3		8-Stage Static Shift Register, Weldseal DIC	7012
N	CD4014BDMSH		8-Stage Static Shift Register, Rad Hard	3294
N	CD4014BDMSR		8-Stage Static Shift Register, Rad Hard	3294
C	CD4014B/3A		8-Stage Static Shift Register	7012
C	CD4014BFBH	JM38510H05752BEA	8-Stage Static Shift Register, Rad Hard	Note 1
C	CD4014BFBR	JM38510R05752BEA	8-Stage Static Shift Register, Rad Hard	Note 1
N	CD4014BFMSH		8-Stage Static Shift Register, Rad Hard	3294
N	CD4014BFMSR		8-Stage Static Shift Register, Rad Hard	3294
C	CD4014BFSH	JM38510H05752SEA	8-Stage Static Shift Register, Rad Hard	Note 1
C	CD4014BFSR	JM38510R05752SEA	8-Stage Static Shift Register, Rad Hard	Note 1
N	CD4014BKMSH		8-Stage Static Shift Register, Rad Hard	3294
N	CD4014BKMSR		8-Stage Static Shift Register, Rad Hard	3294
C	CD4014BQBH	JM38510H05752BNC	8-Stage Static Shift Register, Rad Hard	Note 1
C	CD4014BQBR	JM38510R05752BNC	8-Stage Static Shift Register, Rad Hard	Note 1
C	CD4014BQSH	JM38510H05752SNC	8-Stage Static Shift Register, Rad Hard	Note 1
C	CD4014BQSR	JM38510R05752SNC	8-Stage Static Shift Register, Rad Hard	Note 1
N	CD4015AD3		Dual 4-Stage Static Shift Register, Weldseal DIC	7012
N	CD4015BDMSH		Dual 4-Stage Static Shift Register, Rad Hard	3295
N	CD4015BDMSR		Dual 4-Stage Static Shift Register, Rad Hard	3295
C	CD4015B/3A		Dual 4-Stage Static Shift Register	7012
C	CD4015BFBH	JM38510H05753BEA	Dual 4-Stage Static Shift Register, Rad Hard	Note 1
C	CD4015BFBR	JM38510R05753BEA	Dual 4-Stage Static Shift Register, Rad Hard	Note 1
N	CD4015BFMSH		Dual 4-Stage Static Shift Register, Rad Hard	3295
N	CD4015BFMSR		Dual 4-Stage Static Shift Register, Rad Hard	3295
C	CD4015BFSH	JM38510H05753SEA	Dual 4-Stage Static Shift Register, Rad Hard	Note 1
C	CD4015BFSR	JM38510R05753SEA	Dual 4-Stage Static Shift Register, Rad Hard	Note 1
N	CD4015BK3		Dual 4-Stage Static Shift Register, Field Programmable	7012
N	CD4015BKMSH		Dual 4-Stage Static Shift Register, Rad Hard	3295
N	CD4015BKMSR		Dual 4-Stage Static Shift Register, Rad Hard	3295
C	CD4015BQBH	JM38510H05753BNC	Dual 4-Stage Static Shift Register, Rad Hard	Note 1
C	CD4015BQBR	JM38510R05753BNC	Dual 4-Stage Static Shift Register, Rad Hard	Note 1
C	CD4015BQSH	JM38510H05753SNC	Dual 4-Stage Static Shift Register, Rad Hard	Note 1
C	CD4015BQSR	JM38510R05753SNC	Dual 4-Stage Static Shift Register, Rad Hard	Note 1
N	CD40160BDMSH		4-Bit Decade Counter with Asynchronous Clear, Rad Hard	3358
N	CD40160BDMSR		4-Bit Decade Counter with Asynchronous Clear, Rad Hard	3358
C	CD40160B/3A		4-Bit Decade Counter with Asynchronous Clear	7012
N	CD40160BFMSH		4-Bit Decade Counter with Asynchronous Clear, Rad Hard	3358
N	CD40160BFMSR		4-Bit Decade Counter with Asynchronous Clear, Rad Hard	3358

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	CD40160BKMSH		4-Bit Decade Counter with Asynchronous Clear, Rad Hard	3358
N	CD40160BKMSR		4-Bit Decade Counter with Asynchronous Clear, Rad Hard	3358
N	CD40161BDMSH		4-Bit Binary Counter with Asynchronous Clear, Rad Hard	3358
N	CD40161BDMSR		4-Bit Binary Counter with Asynchronous Clear, Rad Hard	3358
C	CD40161B/3A		4-Bit Binary Counter with Asynchronous Clear	7012
N	CD40161BFMSH		4-Bit Binary Counter with Asynchronous Clear, Rad Hard	3358
N	CD40161BFMSR		4-Bit Binary Counter with Asynchronous Clear, Rad Hard	3358
N	CD40161BKMSH		4-Bit Binary Counter with Asynchronous Clear, Rad Hard	3358
N	CD40161BKMSR		4-Bit Binary Counter with Asynchronous Clear, Rad Hard	3358
N	CD40162BDMSH		4-Bit Decade Counter with Synchronous Clear, Rad Hard	3358
N	CD40162BDMSR		4-Bit Decade Counter with Synchronous Clear, Rad Hard	3358
N	CD40162BFMSH		4-Bit Decade Counter with Synchronous Clear, Rad Hard	3358
N	CD40162BFMSR		4-Bit Decade Counter with Synchronous Clear, Rad Hard	3358
N	CD40162BKMSH		4-Bit Decade Counter with Synchronous Clear, Rad Hard	3358
N	CD40162BKMSR		4-Bit Decade Counter with Synchronous Clear, Rad Hard	3358
N	CD40163BDMSH		4-Bit Binary Counter with Synchronous Clear, Rad Hard	3358
N	CD40163BDMSR		4-Bit Binary Counter with Synchronous Clear, Rad Hard	3358
C	CD40163B/3A		4-Bit Binary Counter with Synchronous Clear	7012
N	CD40163BFMSH		4-Bit Binary Counter with Synchronous Clear, Rad Hard	3358
N	CD40163BFMSR		4-Bit Binary Counter with Synchronous Clear, Rad Hard	3358
N	CD40163BKMSH		4-Bit Binary Counter with Synchronous Clear, Rad Hard	3358
N	CD40163BKMSR		4-Bit Binary Counter with Synchronous Clear, Rad Hard	3358
N	CD4016AD3		Quad Bilateral Switch, Weldseal DIC	7012
N	CD4016BDMSH		Quad Bilateral Switch, Rad Hard	3296
N	CD4016BDMSR		Quad Bilateral Switch, Rad Hard	3296
C	CD4016B/3A	5962-9064001CA	Quad Bilateral Switch, Dual Brand	7012
N	CD4016BFMSH		Quad Bilateral Switch, Rad Hard	3296
N	CD4016BFMSR		Quad Bilateral Switch, Rad Hard	3296
N	CD4016BKMSH		Quad Bilateral Switch, Rad Hard	3296
N	CD4016BKMSR		Quad Bilateral Switch, Rad Hard	3296
N	CD40174BDMSH		4-Bit Binary Counter with Synchronous Clear, Rad Hard	3359
N	CD40174BDMSR		4-Bit Binary Counter with Synchronous Clear, Rad Hard	3359
C	CD40174B/3A		4-Bit Binary Counter with Synchronous Clear	7012
N	CD40174BFMSH		4-Bit Binary Counter with Synchronous Clear, Rad Hard	3359
N	CD40174BFMSR		4-Bit Binary Counter with Synchronous Clear, Rad Hard	3359
N	CD40174BKMSH		4-Bit Binary Counter with Synchronous Clear, Rad Hard	3359
N	CD40174BKMSR		4-Bit Binary Counter with Synchronous Clear, Rad Hard	3359
N	CD40175BDMSH		Quad D-Type Flip-Flop, Rad Hard	3360
N	CD40175BDMSR		Quad D-Type Flip-Flop, Rad Hard	3360
C	CD40175B/3A		Quad D-Type Flip-Flop	7012
N	CD40175BKMSH		Quad D-Type Flip-Flop, Rad Hard	3360
N	CD40175BKMSR		Quad D-Type Flip-Flop, Rad Hard	3360
N	CD4017AD3		Decade Counter/Divider, Weldseal DIC	7012
C	CD4017AFB	JM38510/05601BEA	Decade Counter/Divider	Note 1
N	CD4017BDMSH		Decade Counter/Divider, Rad Hard	3297
N	CD4017BDMSR		Decade Counter/Divider, Rad Hard	3297
C	CD4017B/3A		Decade Counter/Divider	7012
C	CD4017BFB	JM38510/05651BEA	Decade Counter/Divider	Note 1

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	CD4017BFBH	JM38510H05651BEA	Decade Counter/Divider, Rad Hard	Note 1
C	CD4017BFBR	JM38510R05651BEA	Decade Counter/Divider, Rad Hard	Note 1
N	CD4017BFMSH		Decade Counter/Divider, Rad Hard	3297
N	CD4017BFMSR		Decade Counter/Divider, Rad Hard	3297
C	CD4017BFSH	JM38510H05651SEA	Decade Counter/Divider, Rad Hard	Note 1
C	CD4017BFSR	JM38510R05651SEA	Decade Counter/Divider, Rad Hard	Note 1
N	CD4017BKMSH		Decade Counter/Divider, Rad Hard	3297
N	CD4017BKMSR		Decade Counter/Divider, Rad Hard	3297
C	CD4017BQBH	JM38510H05651BNC	Decade Counter/Divider, Rad Hard	Note 1
C	CD4017BQBR	JM38510R05651BNC	Decade Counter/Divider, Rad Hard	Note 1
C	CD4017BQSH	JM38510H05651SNC	Decade Counter/Divider, Rad Hard	Note 1
C	CD4017BQSR	JM38510R05651SNC	Decade Counter/Divider, Rad Hard	Note 1
N	CD40181BDMSH		4-Bit Arithmetic Logic Unit, Rad Hard	3361
N	CD40181BDMSR		4-Bit Arithmetic Logic Unit, Rad Hard	3361
N	CD40181BKMSH		4-Bit Arithmetic Logic Unit, Rad Hard	3361
N	CD40181BKMSR		4-Bit Arithmetic Logic Unit, Rad Hard	3361
N	CD40182BDMSH		Look-Ahead Carry Generator, Rad Hard	3362
N	CD40182BDMSR		Look-Ahead Carry Generator, Rad Hard	3362
N	CD40182BFMSH		Look-Ahead Carry Generator, Rad Hard	3362
N	CD40182BFMSR		Look-Ahead Carry Generator, Rad Hard	3362
N	CD40182BKMSH		Look-Ahead Carry Generator, Rad Hard	3362
N	CD40182BKMSR		Look-Ahead Carry Generator, Rad Hard	3362
N	CD4018BDMSH		Presettable Divide-By N Counter, Rad Hard	3298
N	CD4018BDMSR		Presettable Divide-By N Counter, Rad Hard	3298
C	CD4018B/3A		Presettable Divide-By N Counter	7012
C	CD4018BFB	JM38510/05652BEA	Presettable Divide-By N Counter	Note 1
C	CD4018BFBH	JM38510H05652BEA	Presettable Divide-By N Counter, Rad Hard	Note 1
C	CD4018BFBR	JM38510R05652BEA	Presettable Divide-By N Counter, Rad Hard	Note 1
N	CD4018BFMSH		Presettable Divide-By N Counter, Rad Hard	3298
N	CD4018BFMSR		Presettable Divide-By N Counter, Rad Hard	3298
N	CD4018BFSH	JM38510H05652SEA	Presettable Divide-By N Counter, Rad Hard	Note 1
C	CD4018BFSR	JM38510R05652SEA	Presettable Divide-By N Counter, Rad Hard	Note 1
N	CD4018BK3		Presettable Divide-By N Counter, Field Programmable	7012
N	CD4018BKMSH		Presettable Divide-By N Counter, Rad Hard	3298
N	CD4018BKMSR		Presettable Divide-By N Counter, Rad Hard	3298
C	CD4018BQBH	JM38510H05652BNC	Presettable Divide-By N Counter, Rad Hard	Note 1
C	CD4018BQBR	JM38510R05652BNC	Presettable Divide-By N Counter, Rad Hard	Note 1
C	CD4018BQSH	JM38510H05652SNC	Presettable Divide-By N Counter, Rad Hard	Note 1
C	CD4018BQSR	JM38510R05652SNC	Presettable Divide-By N Counter, Rad Hard	Note 1
N	CD40192BDMSH		Look-Ahead Carry Generator, Rad Hard	3363
N	CD40192BDMSR		Look-Ahead Carry Generator, Rad Hard	3363
C	CD40192B/3A		Look-Ahead Carry Generator	7012
N	CD40192BFMSH		Look-Ahead Carry Generator, Rad Hard	3363
N	CD40192BFMSR		Look-Ahead Carry Generator, Rad Hard	3363
N	CD40192BKMSH		Look-Ahead Carry Generator, Rad Hard	3363
N	CD40192BKMSR		Look-Ahead Carry Generator, Rad Hard	3363
N	CD40193BDMSH		Presettable Up/Down Counter, Rad Hard	3363
N	CD40193BDMSR		Presettable Up/Down Counter, Rad Hard	3363
C	CD40193B/3A		Presettable Up/Down Counter	7012
N	CD40193BFMSH		Presettable Up/Down Counter, Rad Hard	3363

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	CD40193BFMSR		Presettable Up/Down Counter, Rad Hard	3363
N	CD40193BKMSH		Presettable Up/Down Counter, Rad Hard	3363
N	CD40193BKMSR		Presettable Up/Down Counter, Rad Hard	3363
N	CD40194BDMSH		4-Bit Bidirectional Universal Shift Register, Rad Hard	-
N	CD40194BDMSR		4-Bit Bidirectional Universal Shift Register, Rad Hard	-
N	CD40194BFMSH		4-Bit Bidirectional Universal Shift Register, Rad Hard	-
N	CD40194BFMSR		4-Bit Bidirectional Universal Shift Register, Rad Hard	-
N	CD40194BK3		4-Bit Bidirectional Universal Shift Register, Field Program.	7012
N	CD40194BKMSH		4-Bit Bidirectional Universal Shift Register, Rad Hard	-
N	CD40194BKMSR		4-Bit Bidirectional Universal Shift Register, Rad Hard	-
C	CD4019AFB	JM38510/05302BEA	Quad AND/OR Select Gate	Note 1
N	CD4019BDMSH		Quad AND/OR Select Gate, Rad Hard	3299
N	CD4019BDMSR		Quad AND/OR Select Gate, Rad Hard	3299
C	CD4019B/3A		Quad AND/OR Select Gate	7012
C	CD4019BFB	JM38510/05352BEA	Quad AND/OR Select Gate	Note 1
C	CD4019BFBH	JM38510H05352BEA	Quad AND/OR Select Gate, Rad Hard	Note 1
C	CD4019BFBR	JM38510R05352BEA	Quad AND/OR Select Gate, Rad Hard	Note 1
N	CD4019BFMSH		Quad AND/OR Select Gate, Rad Hard	3299
N	CD4019BFMSR		Quad AND/OR Select Gate, Rad Hard	3299
C	CD4019BFSH	JM38510H05352SEA	Quad AND/OR Select Gate, Rad Hard	Note 1
C	CD4019BFSR	JM38510R05352SEA	Quad AND/OR Select Gate, Rad Hard	Note 1
N	CD4019BK3		Quad AND/OR Select Gate, Field Programmable	7012
N	CD4019BKMSH		Quad AND/OR Select Gate, Rad Hard	3299
N	CD4019BKMSR		Quad AND/OR Select Gate, Rad Hard	3299
C	CD4019BQBH	JM38510H05352BNC	Quad AND/OR Select Gate, Rad Hard	Note 1
C	CD4019BQBR	JM38510R05352BNC	Quad AND/OR Select Gate, Rad Hard	Note 1
C	CD4019BQSH	JM38510H05352SNC	Quad AND/OR Select Gate, Rad Hard	Note 1
C	CD4019BQSR	JM38510R05352SNC	Quad AND/OR Select Gate, Rad Hard	Note 1
N	CD40208BDMSH		4 x 4 Multiport Register, Rad Hard	3396
N	CD40208BDMSR		4 x 4 Multiport Register, Rad Hard	3396
N	CD40208BKMSH		4 x 4 Multiport Register, Rad Hard	3396
N	CD40208BKMSR		4 x 4 Multiport Register, Rad Hard	3396
C	CD4020AFB	JM38510/05603BEA	14-Stage Binary Ripple Counter	7012
N	CD4020AK3		14-Stage Binary Ripple Counter, Field Programmable	7012
N	CD4020BDMSH		14-Stage Binary Ripple Counter, Rad Hard	3300
N	CD4020BDMSR		14-Stage Binary Ripple Counter, Rad Hard	3300
C	CD4020B/3A		14-Stage Binary Ripple Counter	7012
C	CD4020BFB	JM38510/05653BEA	14-Stage Binary Ripple Counter	Note 1
C	CD4020BFBH	JM38510H05653BEA	14-Stage Binary Ripple Counter, Rad Hard	Note 1
C	CD4020BFBR	JM38510R05653BEA	14-Stage Binary Ripple Counter, Rad Hard	Note 1
N	CD4020BFMSH		14-Stage Binary Ripple Counter, Rad Hard	3300
N	CD4020BFMSR		14-Stage Binary Ripple Counter, Rad Hard	3300
C	CD4020BFSH	JM38510H05653SEA	14-Stage Binary Ripple Counter, Rad Hard	Note 1
C	CD4020BFSR	JM38510R05653SEA	14-Stage Binary Ripple Counter, Rad Hard	Note 1
N	CD4020BKMSH		14-Stage Binary Ripple Counter, Rad Hard	3300
N	CD4020BKMSR		14-Stage Binary Ripple Counter, Rad Hard	3300
C	CD4020BQBH	JM38510H05653BNC	14-Stage Binary Ripple Counter, Rad Hard	Note 1
C	CD4020BQBR	JM38510R05653BNC	14-Stage Binary Ripple Counter, Rad Hard	Note 1
C	CD4020BQSH	JM38510H05653SNC	14-Stage Binary Ripple Counter, Rad Hard	Note 1

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	CD4020BQSR	JM38510R05653SNC	14-Stage Binary Ripple Counter, Rad Hard	Note 1
N	CD4021AK3		8-Stage Static Shift Register, Field Programmable	7012
N	CD4021BD3		8-Stage Static Shift Register, Weldseal DIC	7012
N	CD4021BDMSH		8-Stage Static Shift Register, Rad Hard	3294
N	CD4021BDMSR		8-Stage Static Shift Register, Rad Hard	3294
C	CD4021B/3A		8-Stage Static Shift Register	7012
C	CD4021BFB	JM38510/05754BEA	8-Stage Static Shift Register	Note 1
C	CD4021BFBH	JM38510H05754BEA	8-Stage Static Shift Register, Rad Hard	Note 1
C	CD4021BFBR	JM38510R05754BEA	8-Stage Static Shift Register, Rad Hard	Note 1
N	CD4021BFMSH		8-Stage Static Shift Register, Rad Hard	3294
N	CD4021BFMSR		8-Stage Static Shift Register, Rad Hard	3294
C	CD4021BFSH	JM38510H05754SEA	8-Stage Static Shift Register, Rad Hard	Note 1
C	CD4021BFSR	JM38510R05754SEA	8-Stage Static Shift Register, Rad Hard	Note 1
N	CD4021BK3		8-Stage Static Shift Register, Field Programmable	7012
N	CD4021BKMSH		8-Stage Static Shift Register, Rad Hard	3294
N	CD4021BKMSR		8-Stage Static Shift Register, Rad Hard	3294
C	CD4021BQBH	JM38510H05754BNC	8-Stage Static Shift Register, Rad Hard	Note 1
C	CD4021BQBR	JM38510R05754BNC	8-Stage Static Shift Register, Rad Hard	Note 1
C	CD4021BQSH	JM38510H05754SNC	8-Stage Static Shift Register, Rad Hard	Note 1
C	CD4021BQSR	JM38510R05754SNC	8-Stage Static Shift Register, Rad Hard	Note 1
N	CD4022BDMSH		Divide-By-8 Counter/Divider, Rad Hard	3297
N	CD4022BDMSR		Divide-By-8 Counter/Divider, Rad Hard	3297
C	CD4022B/3A		Divide-By-8 Counter/Divider	7012
C	CD4022BFBH	JM38510H05654BEA	Divide-By-8 Counter/Divider, Rad Hard	Note 1
C	CD4022BFBR	JM38510R05654BEA	Divide-By-8 Counter/Divider, Rad Hard	Note 1
N	CD4022BFMSH		Divide-By-8 Counter/Divider, Rad Hard	3297
N	CD4022BFMSR		Divide-By-8 Counter/Divider, Rad Hard	3297
C	CD4022BFSH	JM38510H05654SEA	Divide-By-8 Counter/Divider, Rad Hard	Note 1
C	CD4022BFSR	JM38510R05654SEA	Divide-By-8 Counter/Divider, Rad Hard	Note 1
N	CD4022BKMSH		Divide-By-8 Counter/Divider, Rad Hard	3297
N	CD4022BKMSR		Divide-By-8 Counter/Divider, Rad Hard	3297
C	CD4022BQBH	JM38510H05654BNC	Divide-By-8 Counter/Divider, Rad Hard	Note 1
C	CD4022BQBR	JM38510R05654BNC	Divide-By-8 Counter/Divider, Rad Hard	Note 1
C	CD4022BQSH	JM38510H05654SNC	Divide-By-8 Counter/Divider, Rad Hard	Note 1
C	CD4022BQSR	JM38510R05654SNC	Divide-By-8 Counter/Divider, Rad Hard	Note 1
N	CD4023AD3		Triple 3-Input NAND Gate	7012
C	CD4023AFB	JM38510/05003BCA	Triple 3-Input NAND Gate	Note 1
N	CD4023AK3		Triple 3-Input NAND Gate, Field Programmable	7012
N	CD4023BDMSH		Triple 3-Input NAND Gate, Rad Hard	3079
N	CD4023BDMSR		Triple 3-Input NAND Gate, Rad Hard	3079
C	CD4023B/3A		Triple 3-Input NAND Gate	7012
C	CD4023BFB	JM38510/05053BCA	Triple 3-Input NAND Gate	Note 1
C	CD4023BFBH	JM38510H05053BCA	Triple 3-Input NAND Gate, Rad Hard	Note 1
C	CD4023BFBR	JM38510R05053BCA	Triple 3-Input NAND Gate, Rad Hard	Note 1
N	CD4023BFMSH		Triple 3-Input NAND Gate, Rad Hard	3079
N	CD4023BFMSR		Triple 3-Input NAND Gate, Rad Hard	3079
C	CD4023BFSH	JM38510H05053SCA	Triple 3-Input NAND Gate, Rad Hard	Note 1
C	CD4023BFSR	JM38510R05053SCA	Triple 3-Input NAND Gate, Rad Hard	Note 1
N	CD4023BK3		Triple 3-Input NAND Gate, Field Programmable	7012
N	CD4023BKMSH		Triple 3-Input NAND Gate, Rad Hard	3079

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	CD4023BKMSR		Triple 3-Input NAND Gate, Rad Hard	3079
C	CD4023BQBH	JM38510H05053BTC	Triple 3-Input NAND Gate, Rad Hard	Note 1
C	CD4023BQBR	JM38510R05053BTC	Triple 3-Input NAND Gate, Rad Hard	Note 1
C	CD4023BQSH	JM38510H05053STC	Triple 3-Input NAND Gate, Rad Hard	Note 1
C	CD4023BQSR	JM38510R05053STC	Triple 3-Input NAND Gate, Rad Hard	Note 1
N	CD4024AD3		7-Stage Binary Ripple Counter	7012
C	CD4024AFB	JM38510/05605BCA	7-Stage Binary Ripple Counter	Note 1
N	CD4024AK3		7-Stage Binary Ripple Counter, Field Programmable	7012
N	CD4024BDMSH		7-Stage Binary Ripple Counter, Rad Hard	3300
N	CD4024BDMSR		7-Stage Binary Ripple Counter, Rad Hard	3300
C	CD4024B/3A		7-Stage Binary Ripple Counter	7012
C	CD4024BFB	JM38510/05655BCA	7-Stage Binary Ripple Counter	Note 1
C	CD4024BFBH	JM38510H05655BCA	7-Stage Binary Ripple Counter, Rad Hard	Note 1
C	CD4024BFBR	JM38510R05655BCA	7-Stage Binary Ripple Counter, Rad Hard	Note 1
N	CD4024BFMSH		7-Stage Binary Ripple Counter, Rad Hard	3300
N	CD4024BFMSR		7-Stage Binary Ripple Counter, Rad Hard	3300
C	CD4024BFSH	JM38510H05655SCA	7-Stage Binary Ripple Counter, Rad Hard	Note 1
C	CD4024BFSR	JM38510R05655SCA	7-Stage Binary Ripple Counter, Rad Hard	Note 1
N	CD4024BK3		7-Stage Binary Ripple Counter, Field Programmable	7012
N	CD4024BKMSH		7-Stage Binary Ripple Counter, Rad Hard	3300
N	CD4024BKMSR		7-Stage Binary Ripple Counter, Rad Hard	3300
C	CD4024BQBH	JM38510H05655BTC	7-Stage Binary Ripple Counter, Rad Hard	Note 1
N	CD4024BQBR	JM38510R05655BTC	7-Stage Binary Ripple Counter, Rad Hard	Note 1
C	CD4024BQSH	JM38510H05655STC	7-Stage Binary Ripple Counter, Rad Hard	Note 1
C	CD4024BQSR	JM38510R05655STC	7-Stage Binary Ripple Counter, Rad Hard	Note 1
N	CD40257BD3		Quad 2-Line to 1-Line Data Selector/MUX, Weldseal DIC	7012
N	CD40257BDMSH		Quad 2-Line to 1-Line Data Selector/MUX, Rad Hard	3364
N	CD40257BDMSR		Quad 2-Line to 1-Line Data Selector/MUX, Rad Hard	3364
C	CD40257B/3A		Quad 2-Line to 1-Line Data Selector/MUX	7012
N	CD40257BFMSH		Quad 2-Line to 1-Line Data Selector/MUX, Rad Hard	3364
N	CD40257BFMSR		Quad 2-Line to 1-Line Data Selector/MUX, Rad Hard	3364
N	CD40257BKMSH		Quad 2-Line to 1-Line Data Selector/MUX, Rad Hard	3364
N	CD40257BKMSR		Quad 2-Line to 1-Line Data Selector/MUX, Rad Hard	3364
N	CD4025AD3		Triple 3-Input NOR Gate, Weldseal DIC	7012
C	CD4025AFB	JM38510/05204BCA	Triple 3-Input NOR Gate	Note 1
N	CD4025BDMSH		Triple 3-Input NOR Gate, Rad Hard	3289
N	CD4025BDMSR		Triple 3-Input NOR Gate, Rad Hard	3289
C	CD4025B/3A		Triple 3-Input NOR Gate	7012
C	CD4025BFB	JM38510/05254BCA	Triple 3-Input NOR Gate	Note 1
C	CD4025BFBH	JM38510H05254BCA	Triple 3-Input NOR Gate, Rad Hard	Note 1
C	CD4025BFBR	JM38510R05254BCA	Triple 3-Input NOR Gate, Rad Hard	Note 1
N	CD4025BFMSH		Triple 3-Input NOR Gate, Rad Hard	3289
N	CD4025BFMSR		Triple 3-Input NOR Gate, Rad Hard	3289
C	CD4025BFSH	JM38510H05254SCA	Triple 3-Input NOR Gate, Rad Hard	Note 1
C	CD4025BFSR	JM38510R05254SCA	Triple 3-Input NOR Gate, Rad Hard	Note 1
N	CD4025BKMSH		Triple 3-Input NOR Gate, Rad Hard	3289
N	CD4025BKMSR		Triple 3-Input NOR Gate, Rad Hard	3289
C	CD4025BQBH	JM38510H05254BTC	Triple 3-Input NOR Gate, Rad Hard	Note 1
C	CD4025BQBR	JM38510R05254BTC	Triple 3-Input NOR Gate, Rad Hard	Note 1
C	CD4025BQSH	JM38510H05254STC	Triple 3-Input NOR Gate, Rad Hard	Note 1

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	CD4025BQSR	JM38510R05254STC	Triple 3-Input NOR Gate, Rad Hard	Note 1
N	CD4025UBD3		Triple 3-Input NOR Gate, Weldseal DIC	7012
N	CD4027AD3		Dual J-K Flip-Flop with Set/Reset Capability	7012
C	CD4027AFB	JM38510/05102BEA	Dual J-K Flip-Flop with Set/Reset Capability	Note 1
N	CD4027AK3		Dual J-K Flip-Flop with Set/Reset Capability	7012
N	CD4027BD3		Dual J-K Flip-Flop with Set/Reset Capability	7012
N	CD4027BDMSH		Dual J-K Flip-Flop with Set/Reset Capability, Rad Hard	3302
N	CD4027BDMSR		Dual J-K Flip-Flop with Set/Reset Capability, Rad Hard	3302
C	CD4027B/3A		Dual J-K Flip-Flop with Set/Reset Capability	7012
C	CD4027BFB	JM38510/05152BEA	Dual J-K Flip-Flop with Set/Reset Capability	Note 1
C	CD4027BFBH	JM38510H05152BEA	Dual J-K Flip-Flop with Set/Reset Capability, Rad Hard	Note 1
C	CD4027BFBR	JM38510R05152BEA	Dual J-K Flip-Flop with Set/Reset Capability, Rad Hard	Note 1
N	CD4027BFMSH		Dual J-K Flip-Flop with Set/Reset Capability, Rad Hard	3302
N	CD4027BFMSR		Dual J-K Flip-Flop with Set/Reset Capability, Rad Hard	3302
C	CD4027BFSH	JM38510H05152SEA	Dual J-K Flip-Flop with Set/Reset Capability, Rad Hard	Note 1
C	CD4027BFSR	JM38510R05152SEA	Dual J-K Flip-Flop with Set/Reset Capability, Rad Hard	Note 1
N	CD4027BK3		Dual J-K Flip-Flop with Set/Reset Capability	7012
N	CD4027BKMSH		Dual J-K Flip-Flop with Set/Reset Capability, Rad Hard	3302
N	CD4027BKMSR		Dual J-K Flip-Flop with Set/Reset Capability, Rad Hard	3302
C	CD4027BQBH	JM38510H05152BNC	Dual J-K Flip-Flop with Set/Reset Capability, Rad Hard	Note 1
C	CD4027BQBR	JM38510R05152BNC	Dual J-K Flip-Flop with Set/Reset Capability, Rad Hard	Note 1
C	CD4027BQSH	JM38510H05152SNC	Dual J-K Flip-Flop with Set/Reset Capability, Rad Hard	Note 1
C	CD4027BQSR	JM38510R05152SNC	Dual J-K Flip-Flop with Set/Reset Capability, Rad Hard	Note 1
N	CD4028AD3		BCD-to-Decimal Decoder, Weldseal DIC	7012
N	CD4028BDMSH		BCD-to-Decimal Decoder, Rad Hard	3303
N	CD4028BDMSR		BCD-to-Decimal Decoder, Rad Hard	3303
C	CD4028B/3A		BCD-to-Decimal Decoder	7012
C	CD4028BFBR	JM38510R05951BEA	BCD-to-Decimal Decoder, Rad Hard	Note 1
N	CD4028BFMSH		BCD-to-Decimal Decoder, Rad Hard	3303
N	CD4028BFMSR		BCD-to-Decimal Decoder, Rad Hard	3303
C	CD4028BFSR	JM38510R05951SEA	BCD-to-Decimal Decoder, Rad Hard	Note 1
N	CD4028BK3		BCD-to-Decimal Decoder, Field Programmable	7012
N	CD4028BKMSH		BCD-to-Decimal Decoder, Rad Hard	3303
N	CD4028BKMSR		BCD-to-Decimal Decoder, Rad Hard	3303
C	CD4028BQBR	JM38510R05951BNC	BCD-to-Decimal Decoder, Rad Hard	Note 1
C	CD4028BQSR	JM38510R05951SNC	BCD-to-Decimal Decoder, Rad Hard	Note 1
N	CD4029AD3		Presettable Up/Down Counter	7012
N	CD4029BD3		Presettable Up/Down Counter, Weldseal DIC	7012
N	CD4029BDMSH		Presettable Up/Down Counter, Rad Hard	3304
N	CD4029BDMSR		Presettable Up/Down Counter, Rad Hard	3304
C	CD4029B/3A	8101602EA	Presettable Up/Down Counter, Dual Brand	7012
N	CD4029BFMSH		Presettable Up/Down Counter, Rad Hard	3304
N	CD4029BFMSR		Presettable Up/Down Counter, Rad Hard	3304
N	CD4029BK3		Presettable Up/Down Counter, Field Programmable	7012
N	CD4029BKMSH		Presettable Up/Down Counter, Rad Hard	3304
N	CD4029BKMSR		Presettable Up/Down Counter, Rad Hard	3304
N	CD4030BDMSH		Quad Exclusive OR Gate, Rad Hard	3305
N	CD4030BDMSR		Quad Exclusive OR Gate, Rad Hard	3305
C	CD4030B/3A		Quad Exclusive-OR Gate	7012
C	CD4030BFB	JM38510/05353BCA	Quad Exclusive-OR Gate	Note 1

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PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	CD4030BFBH	JM38510H05353BCA	Quad Exclusive OR Gate, Rad Hard	Note 1
C	CD4030BFBR	JM38510R05353BCA	Quad Exclusive OR Gate, Rad Hard	Note 1
N	CD4030BFMSH		Quad Exclusive-OR Gate, Rad Hard	3305
N	CD4030BFMSR		Quad Exclusive OR Gate, Rad Hard	3305
C	CD4030BFSH	JM38510H05353SCA	Quad Exclusive OR Gate, Rad Hard	Note 1
C	CD4030BFSR	JM38510R05353SCA	Quad Exclusive OR Gate, Rad Hard	Note 1
N	CD4030BKMSH		Quad Exclusive OR Gate, Rad Hard	3305
N	CD4030BKMSR		Quad Exclusive OR Gate, Rad Hard	3305
C	CD4030BQBH	JM38510H05353BTC	Quad Exclusive OR Gate, Rad Hard	Note 1
C	CD4030BQBR	JM38510R05353BTC	Quad Exclusive OR Gate, Rad Hard	Note 1
C	CD4030BQSH	JM38510H05353STC	Quad Exclusive OR Gate, Rad Hard	Note 1
C	CD4030BQSR	JM38510R05353STC	Quad Exclusive OR Gate, Rad Hard	Note 1
N	CD4031BDMSH		64-Stage Static Shift Register, Rad Hard	3306
N	CD4031BDMSR		64-Stage Static Shift Register, Rad Hard	3306
C	CD4031B/3A		64-Stage Static Shift Register	7012
N	CD4031BFMSH		64-Stage Static Shift Register, Rad Hard	3306
N	CD4031BFMSR		64-Stage Static Shift Register, Rad Hard	3306
N	CD4031BK3		64-Stage Static Shift Register, Field Programmable	7012
N	CD4031BKMSH		64-Stage Static Shift Register, Rad Hard	3306
N	CD4031BKMSR		64-Stage Static Shift Register, Rad Hard	3306
N	CD4033BDMSH		Decade Counter/Divider, Rad Hard	3301
N	CD4033BDMSR		Decade Counter/Divider, Rad Hard	3301
N	CD4033BFMSH		Decade Counter/Divider, Rad Hard	3301
N	CD4033BFMSR		Decade Counter/Divider, Rad Hard	3301
N	CD4033BKMSH		Decade Counter/Divider, Rad Hard	3301
N	CD4033BKMSR		Decade Counter/Divider, Rad Hard	3301
N	CD4034BDMSH		8-Stage Static Shift Register, Rad Hard	3307
N	CD4034BDMSR		8-Stage Static Shift Register, Rad Hard	3307
C	CD4034B/3A		8-Stage Static Shift Register	7012
N	CD4034BKMSH		8-Stage Static Shift Register, Rad Hard	3307
N	CD4034BKMSR		8-Stage Static Shift Register, Rad Hard	3307
N	CD4035BD3		4-Stage Parallel-In/Parallel-Out Shift Register	7012
N	CD4035BDMSH		4-Stage Parallel-In/Parallel-Out Shift Register, Rad Hard	3308
N	CD4035BDMSR		4-Stage Parallel-In/Parallel-Out Shift Register, Rad Hard	3308
C	CD4035B/3A	8101701EA	4-Stage Parallel-In/Parallel-Out Shift Register	7012
N	CD4035BFMSH		4-Stage Parallel-In/Parallel-Out Shift Register, Rad Hard	3308
N	CD4035BFMSR		4-Stage Parallel-In/Parallel-Out Shift Register, Rad Hard	3308
N	CD4035BK3		4-Stage Parallel-In/Parallel-Out Shift Register	7012
N	CD4035BKMSH		4-Stage Parallel-In/Parallel-Out Shift Register, Rad Hard	3308
N	CD4035BKMSR		4-Stage Parallel-In/Parallel-Out Shift Register, Rad Hard	3308
N	CD4040AD3		12-Stage Binary Ripple Counter, Weldseal DIC	7012
N	CD4040AK3		12-Stage Binary Ripple Counter, Weldseal Flatpack	7012
N	CD4040BD3		12-Stage Binary Ripple Counter, Weldseal DIC	7012
N	CD4040BDMSH		12-Stage Binary Ripple Counter, Rad Hard	3300
N	CD4040BDMSR		12-Stage Binary Ripple Counter, Rad Hard	3300
C	CD4040B/3A		12-Stage Binary Ripple Counter	7012
N	CD4040BFMSH		12-Stage Binary Ripple Counter, Rad Hard	3300
N	CD4040BFMSR		12-Stage Binary Ripple Counter, Rad Hard	3300
N	CD4040BKMSH		12-Stage Binary Ripple Counter, Rad Hard	3300
N	CD4040BKMSR		12-Stage Binary Ripple Counter, Rad Hard	3300

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	CD4041AD3		Quad True/Complement Buffer, Weldseal DIC	7012
N	CD4041UBDMSH		Quad True/Complement Buffer, Rad Hard	3309
N	CD4041UBDMSR		Quad True/Complement Buffer, Rad Hard	3309
C	CD4041UB/3A		Quad True/Complement Buffer	7012
C	CD4041UBFBR	JM38510R05555BCA	Quad True/Complement Buffer, Rad Hard	Note 1
N	CD4041UBFMSH		Quad True/Complement Buffer, Rad Hard	3309
N	CD4041UBFMSR		Quad True/Complement Buffer, Rad Hard	3309
N	CD4041UBFMSR		Quad True/Complement Buffer, Rad Hard	3309
C	CD4041UBFSR	JM38510R05555SCA	Quad True/Complement Buffer, Rad Hard	Note 1
N	CD4041UBK3		Quad True/Complement Buffer, Weldseal Field Programmable	7012
N	CD4041UBKMSH		Quad True/Complement Buffer, Rad Hard	3309
N	CD4041UBKMSR		Quad True/Complement Buffer, Rad Hard	3309
N	CD4041UBKMSR		Quad True/Complement Buffer, Rad Hard	3309
C	CD4041UBQBR	JM38510R05555BTC	Quad True/Complement Buffer, Rad Hard	Note 1
C	CD4041UBQSR	JM38510R05555STC	Quad True/Complement Buffer, Rad Hard	Note 1
N	CD4042AD3		Quad True/Complement Buffer, Weldseal DIC	7012
N	CD4042BDMSH		Quad Clocked D-Latch, Rad Hard	3310
N	CD4042BDMSR		Quad Clocked D-Latch, Rad Hard	3310
C	CD4042B/3A		Quad Clocked D Latch	7012
N	CD4042BFMSH		Quad Clocked D-Latch, Rad Hard	3310
N	CD4042BFMSR		Quad Clocked D Latch, Rad Hard	3310
N	CD4042BK3		Quad Clocked D Latch, Weldseal Flatpack	7012
N	CD4042BKMSH		Quad Clocked D-Latch, Rad Hard	3310
N	CD4042BKMSR		Quad Clocked D Latch, Rad Hard	3310
N	CD4043BDMSH		Quad NOR R/S Latch, Three-State Outputs, Rad Hard	3311
N	CD4043BDMSR		Quad NOR R/S Latch, Three-State Outputs, Rad Hard	3311
C	CD4043B/3A		Quad NOR R/S Latch, Three-State Outputs	7012
N	CD4043BFMSH		Quad NOR R/S Latch, Three-State Outputs, Rad Hard	3311
N	CD4043BFMSR		Quad NOR R/S Latch, Three-State Outputs, Rad Hard	3311
N	CD4043BKMSH		Quad NOR R/S Latch, Three-State Outputs, Rad Hard	3311
N	CD4043BKMSR		Quad NOR R/S Latch, Three-State Outputs, Rad Hard	3311
N	CD4044BD3		Quad NAND R/S Latch, Three-State Outputs, Weldseal DIC	7012
N	CD4044BDMSH		Quad NAND R/S Latch, Three-State Outputs, Rad Hard	3311
N	CD4044BDMSR		Quad NAND R/S Latch, Three-State Outputs, Rad Hard	3311
C	CD4044B/3A		Quad NAND R/S Latch, Three-State Outputs	7012
N	CD4044BFMSH		Quad NAND R/S Latch, Three-State Outputs, Rad Hard	3311
N	CD4044BFMSR		Quad NAND R/S Latch, Three-State Outputs, Rad Hard	3311
N	CD4044BKMSH		Quad NAND R/S Latch, Three-State Outputs, Rad Hard	3311
N	CD4044BKMSR		Quad NAND R/S Latch, Three-State Outputs, Rad Hard	3311
N	CD4046AD3		Micropower Phase-Locked Loop	7012
N	CD4046BD3		Micropower Phase-Locked Loop Weldseal DIC	7012
N	CD4046BDMSH		Micropower Phase-Locked Loop, Rad Hard	3312
N	CD4046BDMSR		Micropower Phase-Locked Loop, Rad Hard	3312
C	CD4046B/3A		Micropower Phase-Locked Loop	7012
N	CD4046BFMSH		Micropower Phase-Locked Loop, Rad Hard	3312
N	CD4046BFMSR		Micropower Phase-Locked Loop, Rad Hard	3312
N	CD4046BK3		Micropower Phase-Locked Loop Weldseal FP, Field Program.	7012
N	CD4046BKMSH		Micropower Phase-Locked Loop, Rad Hard	3312

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	CD4046BKMSR		Micropower Phase-Locked Loop, Rad Hard	3312
N	CD4047BD3		Monostable/Astable Multivibrator, Weldseal DIC	7012
N	CD4047BDMSH		Monostable/Astable Multivibrator, Rad Hard	3313
N	CD4047BDMSR		Monostable/Astable Multivibrator, Rad Hard	3313
C	CD4047B/3A	8102001CA	Monostable/Astable Multivibrator, Dual Brand	7012
N	CD4047BFMSH		Monostable/Astable Multivibrator, Rad Hard	3313
N	CD4047BFMSR		Monostable/Astable Multivibrator, Rad Hard	3313
N	CD4047BKMSH		Monostable/Astable Multivibrator, Rad Hard	3313
N	CD4047BKMSR		Monostable/Astable Multivibrator, Rad Hard	3313
N	CD4048AD3		Multifunctional Expandable 8-Input Gate, Three-State Output	7012
N	CD4048BD3		Multifunctional Expandable 8-Input Gate, Three-State Output	7012
N	CD4048BDMSH		Multifunctional Expandable 8-Input Gate, Three-State Output Rad Hard	3314
N	CD4048BDMSR		Multifunctional Expandable 8-Input Gate, Three-State Output Rad Hard	3314
C	CD4048B/3A		Multifunctional Expandable 8-Input Gate, Three-State Output	7012
N	CD4048BFMSH		Multifunctional Expandable 8-Input Gate, Three-State Output Rad Hard	3314
N	CD4048BFMSR		Multifunctional Expandable 8-Input Gate, Three-State Output Rad Hard	3314
N	CD4048BKMSH		Multifunctional Expandable 8-Input Gate, Three-State Output Rad Hard	3314
N	CD4048BKMSR		Multifunctional Expandable 8-Input Gate, Three-State Output Rad Hard	3314
N	CD4049AD3		Hex Buffer/Converter, Inverting Weldseal DIC	7012
C	CD4049AFB	JM38510/05503BEA	Hex Buffer/Converter, Inverting	Note 1
N	CD4049UBD3		Hex Buffer/Converter, Inverting, Weldseal DIC	7012
N	CD4049UBDMSH		Hex Buffer/Converter, Inverting, Rad Hard	3315
N	CD4049UBDMSR		Hex Buffer/Converter, Inverting, Rad Hard	3315
C	CD4049UB/3A		Hex Buffer/Converter, Inverting	7012
C	CD4049UBFB	JM38510/05553BEA	Hex Buffer/Converter, Inverting,	Note 1
C	CD4049UBFBH	JM38510H05553BEA	Hex Buffer/Converter, Inverting, Rad Hard	Note 1
C	CD4049UBFBR	JM38510R05553BEA	Hex Buffer/Converter, Inverting, Rad Hard	Note 1
N	CD4049UBFMSH		Hex Buffer/Converter, Inverting, Rad Hard	3315
N	CD4049UBFMSR		Hex Buffer/Converter, Inverting, Rad Hard	3315
C	CD4049UBFSH	JM38510H05553SEA	Hex Buffer/Converter, Inverting, Rad Hard	Note 1
C	CD4049UBFSR	JM38510R05553SEA	Hex Buffer/Converter, Inverting, Rad Hard	Note 1
N	CD4049UBK3		Hex Buffer/Converter, Inverting, Weldseal Field Programmable	7012
N	CD4049UBKMSH		Hex Buffer/Converter, Inverting, Rad Hard	3315
N	CD4049UBKMSR		Hex Buffer/Converter, Inverting, Rad Hard	3315
C	CD4049UBQBH	JM38510H05553BNC	Hex Buffer/Converter, Inverting, Rad Hard	Note 1
C	CD4049UBQBR	JM38510R05553BNC	Hex Buffer/Converter, Inverting, Rad Hard	Note 1
C	CD4049UBQSH	JM38510H05553SNC	Hex Buffer/Converter, Inverting, Rad Hard	Note 1
C	CD4049UBQSR	JM38510R05553SNC	Hex Buffer/Converter, Inverting, Rad Hard	Note 1
C	CD4050AFB	JM38510/05504BEA	Hex Buffer/Converter, Non-Inverting	Note 1
N	CD4050BD3		Hex Buffer/Converter, Non-Inverting	7012
N	CD4050BDMSH		Hex Buffer/Converter, Non-Inverting, Rad Hard	3193
N	CD4050BDMSR		Hex Buffer/Converter, Non-Inverting, Rad Hard	3193
C	CD4050B/3A		Hex Buffer/Converter, Non-Inverting	7012
C	CD4050BFB	JM38510/05554BEA	Hex Buffer/Converter, Non-Inverting	Note 1

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	CD4050BFBH	JM38510H05554BEA	Hex Buffer/Converter, Non-Inverting, Rad Hard	Note 1
C	CD4050BFBR	JM38510R05554BEA	Hex Buffer/Converter, Non-Inverting, Rad Hard	Note 1
N	CD4050BFMSH		Hex Buffer/Converter, Non-Inverting, Rad Hard	3193
N	CD4050BFMSR		Hex Buffer/Converter, Non-Inverting, Rad Hard	3193
C	CD4050BFSH	JM38510H05554SEA	Hex Buffer/Converter, Non-Inverting, Rad Hard	Note 1
C	CD4050BFSR	JM38510R05554SEA	Hex Buffer/Converter, Non-Inverting, Rad Hard	Note 1
N	CD4050BK3		Hex Buffer/Converter, Non-Inverting, Field Programmable	7012
N	CD4050BKMSH		Hex Buffer/Converter, Non-Inverting, Rad Hard	3193
N	CD4050BKMSR		Hex Buffer/Converter, Non-Inverting, Rad Hard	3193
C	CD4050BQBH	JM38510H05554BNC	Hex Buffer/Converter, Non-Inverting, Rad Hard	Note 1
C	CD4050BQBR	JM38510R05554BNC	Hex Buffer/Converter, Non-Inverting, Rad Hard	Note 1
C	CD4050BQSH	JM38510H05554SNC	Hex Buffer/Converter, Non-Inverting, Rad Hard	Note 1
C	CD4050BQSR	JM38510R05554SNC	Hex Buffer/Converter, Non-Inverting, Rad Hard	Note 1
N	CD4051BD3		8-Channel Analog MUX/DeMUX, Weldseal DIC	7012
N	CD4051BDMSH		8-Channel Analog MUX/DeMUX, Rad Hard	3316
N	CD4051BDMSR		8-Channel Analog MUX/DeMUX, Rad Hard	3316
C	CD4051B/3A		8-Channel Analog MUX/DeMUX	7012
N	CD4051BFMSH		8-Channel Analog MUX/DeMUX, Rad Hard	3316
N	CD4051BFMSR		8-Channel Analog MUX/DeMUX, Rad Hard	3316
N	CD4051BK3		8-Channel Analog MUX/DeMUX, Field Programmable	7012
N	CD4051BKMSH		8-Channel Analog MUX/DeMUX, Rad Hard	3316
N	CD4051BKMSR		8-Channel Analog MUX/DeMUX, Rad Hard	3316
N	CD4052BDMSH		4-Channel Analog MUX/DeMUX, Rad Hard	3316
N	CD4052BDMSR		4-Channel Analog MUX/DeMUX, Rad Hard	3316
C	CD4052B/3A	7901502EA	4-Channel Analog MUX/DeMUX, Dual Brand	7012
N	CD4052BFMSH		4-Channel Analog MUX/DeMUX, Rad Hard	3316
N	CD4052BFMSR		4-Channel Analog MUX/DeMUX, Rad Hard	3316
N	CD4052BKMSH		4-Channel Analog MUX/DeMUX, Rad Hard	3316
N	CD4052BKMSR		4-Channel Analog MUX/DeMUX, Rad Hard	3316
N	CD4053BD3		Triple 2-Channel Analog MUX/DeMUX, Weldseal DIC	7012
N	CD4053BDMSH		Triple 2-Channel Analog MUX/DeMUX, Rad Hard	3316
N	CD4053BDMSR		Triple 2-Channel Analog MUX/DeMUX, Rad Hard	3316
C	CD4053B/3A	810801EA	Triple 2-Channel Analog MUX/DeMUX, Dual Brand	7012
N	CD4053BFMSH		Triple 2-Channel Analog MUX/DeMUX, Rad Hard	3316
N	CD4053BFMSR		Triple 2-Channel Analog MUX/DeMUX, Rad Hard	3316
N	CD4053BKMSH		Triple 2-Channel Analog MUX/DeMUX, Rad Hard	3316
N	CD4053BKMSR		Triple 2-Channel Analog MUX/DeMUX, Rad Hard	3316
C	CD4054B/3A		4-Segment Display Coder Driver	7012
C	CD4056B/3A		BCD To 7-Segment Driver Strobe Latch	7012
N	CD4059AD3		Programmable Divide-By-N Counter, Weldseal DIC	7012
N	CD4060AD3		14-Stage Binary Ripple Counter/Divider, Weldseal DIC	7012
N	CD4060BDMSH		14-Stage Binary Ripple Counter/Divider, Rad Hard	3317
N	CD4060BDMSR		14-Stage Binary Ripple Counter/Divider, Rad Hard	3317
C	CD4060B/3A		14-Stage Binary Ripple Counter/Divider	7012
N	CD4060BFMSH		14-Stage Binary Ripple Counter/Divider, Rad Hard	3317
N	CD4060BFMSR		14-Stage Binary Ripple Counter/Divider, Rad Hard	3317
N	CD4060BKMSH		14-Stage Binary Ripple Counter/Divider, Rad Hard	3317
N	CD4060BKMSR		14-Stage Binary Ripple Counter/Divider, Rad Hard	3317
N	CD4063BD3		4-Bit Magnitude Comparator, DIC	7012

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	CD4063BDMSH		4-Bit Magnitude Comparator, Rad Hard	3318
N	CD4063BDMSR		4-Bit Magnitude Comparator, Rad Hard	3318
C	CD4063B/3A		4-Bit Magnitude Comparator	7012
N	CD4063BFMSH		4-Bit Magnitude Comparator, Rad Hard	3318
N	CD4063BFMSR		4-Bit Magnitude Comparator, Rad Hard	3318
N	CD4063BKMSH		4-Bit Magnitude Comparator, Rad Hard	3318
N	CD4063BKMSR		4-Bit Magnitude Comparator, Rad Hard	3318
N	CD4066AD3		Quad Bilateral Switch, Weldseal DIC	7012
N	CD4066BD3		Quad Bilateral Switch, Weldseal DIC	7012
N	CD4066BDMSH		Quad Bilateral Switch, Rad Hard	3319
N	CD4066BDMSR		Quad Bilateral Switch, Rad Hard	3319
C	CD4066B/3A		Quad Bilateral Switch	7012
C	CD4066BFB	JM38510/05852BCA	Quad Bilateral Switch	Note 1
C	CD4066BFBH	JM38510H05852BCA	Quad Bilateral Switch, Rad Hard	Note 1
C	CD4066BFBR	JM38510R05852BCA	Quad Bilateral Switch, Rad Hard	Note 1
N	CD4066BFMSH		Quad Bilateral Switch, Rad Hard	3319
N	CD4066BFMSR		Quad Bilateral Switch, Rad Hard	3319
C	CD4066BFSH	JM38510H05852SCA	Quad Bilateral Switch, Rad Hard	Note 1
C	CD4066BFSR	JM38510R05852SCA	Quad Bilateral Switch, Rad Hard	Note 1
N	CD4066BK3		Quad Bilateral Switch, Weldseal Flatpack	7012
N	CD4066BKMSH		Quad Bilateral Switch, Rad Hard	3319
N	CD4066BKMSR		Quad Bilateral Switch, Rad Hard	3319
C	CD4066BQBH	JM38510H05852BTC	Quad Bilateral Switch, Rad Hard	Note 1
C	CD4066BQBR	JM38510R05852BTC	Quad Bilateral Switch, Rad Hard	Note 1
C	CD4066BQSH	JM38510H05852STC	Quad Bilateral Switch, Rad Hard	Note 1
C	CD4066BQSR	JM38510R05852STC	Quad Bilateral Switch, Rad Hard	Note 1
N	CD4067BDMSH		16-Channel Analog MUX/DeMUX, Rad Hard	3190
N	CD4067BDMSR		16-Channel Analog MUX/DeMUX, Rad Hard	3190
C	CD4067B/3A		16-Channel Analog MUX/DeMUX	7012
N	CD4067BFMSR		16-Channel Analog MUX/DeMUX, Rad Hard	3190
N	CD4067BKMSH		16-Channel Analog MUX/DeMUX, Rad Hard	3190
N	CD4067BKMSR		16-Channel Analog MUX/DeMUX, Rad Hard	3190
N	CD4068BD3		8-Input NAND/AND Gate, Weldseal DIC	7012
N	CD4068BDMSH		8-Input NAND/AND Gate, Rad Hard	3320
N	CD4068BDMSR		8-Input NAND/AND Gate, Rad Hard	3320
C	CD4068B/3A		8-Input NAND/AND Gate	7012
N	CD4068BFMSH		8-Input NAND/AND Gate, Rad Hard	3320
N	CD4068BFMSR		8-Input NAND/AND Gate, Rad Hard	3320
N	CD4068BKMSH		8-Input NAND/AND Gate, Rad Hard	3320
N	CD4068BKMSR		8-Input NAND/AND Gate, Rad Hard	3320
N	CD4069UBDMSH		Hex Inverter, Rad Hard	3321
N	CD4069UBDMSR		Hex Inverter, Rad Hard	3321
C	CD4069UB/3A		Hex Inverter	7012
C	CD4069UBFB	JM38510/17401BCA	Hex Inverter	Note 1
C	CD4069UBFBH	JM38510H17401BCA	Hex Inverter, Rad Hard	Note 1
C	CD4069UBFBR	JM38510R17401BCA	Hex Inverter, Rad Hard	Note 1
N	CD4069UBFMSH		Hex Inverter, Rad Hard	3321
N	CD4069UBFMSR		Hex Inverter, Rad Hard	3321
C	CD4069UBFSH	JM38510H17401SCA	Hex Inverter, Rad Hard	Note 1
C	CD4069UBFSR	JM38510R17401SCA	Hex Inverter, Rad Hard	Note 1

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	CD4069UBKMSH		Hex Inverter, Rad Hard	3321
N	CD4069UBKMSR		Hex Inverter, Rad Hard	3321
C	CD4069UBQBH	JM38510H17401BTC	Hex Inverter, Rad Hard	Note 1
C	CD4069UBQBR	JM38510R17401BTC	Hex Inverter, Rad Hard	Note 1
C	CD4069UBQSH	JM38510H17401STC	Hex Inverter, Rad Hard	Note 1
C	CD4069UBQSR	JM38510R17401STC	Hex Inverter, Rad Hard	Note 1
N	CD4070BDMSH		Quad Exclusive-OR Gate, Rad Hard	3322
N	CD4070BDMSR		Quad Exclusive-OR Gate, Rad Hard	3322
C	CD4070B/3A		Quad Exclusive-OR Gate	7012
C	CD4070BFB	JM38510/17203BCA	Quad Exclusive-OR Gate	Note 1
C	CD4070BFBH	JM38510H17203BCA	Quad Exclusive-OR Gate, Rad Hard	Note 1
C	CD4070BFBR	JM38510R17203BCA	Quad Exclusive-OR Gate, Rad Hard	Note 1
N	CD4070BFMSH		Quad Exclusive-OR Gate, Rad Hard	3322
N	CD4070BFMSR		Quad Exclusive-OR Gate, Rad Hard	3322
C	CD4070BFSH	JM38510H17203SCA	Quad Exclusive-OR Gate, Rad Hard	Note 1
C	CD4070BFSR	JM38510R17203SCA	Quad Exclusive-OR Gate, Rad Hard	Note 1
N	CD4070BKMSH		Quad Exclusive-OR Gate, Rad Hard	3322
N	CD4070BKMSR		Quad Exclusive-OR Gate, Rad Hard	3322
C	CD4070BQBH	JM38510H17203BTC	Quad Exclusive-OR Gate, Rad Hard	Note 1
C	CD4070BQBR	JM38510R17203BTC	Quad Exclusive-OR Gate, Rad Hard	Note 1
C	CD4070BQSH	JM38510H17203STC	Quad Exclusive-OR Gate, Rad Hard	Note 1
C	CD4070BQSR	JM38510R17203STC	Quad Exclusive-OR Gate, Rad Hard	Note 1
N	CD4071BD3		Quad 2-Input OR Gate, Weldseal DIC	7012
N	CD4071BDMSH		Quad 2-Input OR Gate, Rad Hard	3323
N	CD4071BDMSR		Quad 2-Input OR Gate, Rad Hard	3323
C	CD4071B/3A		Quad 2-Input OR Gate	7012
C	CD4071BFB	JM38510/17101BCA	Quad 2-Input OR Gate	Note 1
C	CD4071BFBH	JM38510H17101BCA	Quad 2-Input OR Gate, Rad Hard	Note 1
C	CD4071BFBR	JM38510R17101BCA	Quad 2-Input OR Gate, Rad Hard	Note 1
N	CD4071BFMSH		Quad 2-Input OR Gate, Rad Hard	3323
N	CD4071BFMSR		Quad 2-Input OR Gate, Rad Hard	3323
C	CD4071BFSH	JM38510H17101SCA	Quad 2-Input OR Gate, Rad Hard	Note 1
C	CD4071BFSR	JM38510R17101SCA	Quad 2-Input OR Gate, Rad Hard	Note 1
N	CD4071BK3		Quad 2-Input OR Gate, Weldseal Flatpack	7012
N	CD4071BKMSH		Quad 2-Input OR Gate, Rad Hard	3323
N	CD4071BKMSR		Quad 2-Input OR Gate, Rad Hard	3323
C	CD4071BQBH	JM38510H17101BTC	Quad 2-Input OR Gate, Rad Hard	Note 1
C	CD4071BQBR	JM38510R17101BTC	Quad 2-Input OR Gate, Rad Hard	Note 1
C	CD4071BQSH	JM38510H17101STC	Quad 2-Input OR Gate, Rad Hard	Note 1
C	CD4071BQSR	JM38510R17101STC	Quad 2-Input OR Gate, Rad Hard	Note 1
N	CD4072BD3		Dual 4-Input OR Gate, Weldseal DIC	7012
N	CD4072BDMSH		Dual 4-Input OR Gate, Rad Hard	3323
N	CD4072BDMSR		Dual 4-Input OR Gate, Rad Hard	3323
C	CD4072B/3A	7706002CA	Dual 4-Input OR Gate, Dual Brand	7012
C	CD4072BFBR	JM38510R17102BCA	Dual 4-Input OR Gate, Rad Hard	Note 1
N	CD4072BFMSH		Dual 4-Input OR Gate, Rad Hard	3323
N	CD4072BFMSR		Dual 4-Input OR Gate, Rad Hard	3323
N	CD4072BKMSH		Dual 4-Input OR Gate, Rad Hard	3323
N	CD4072BKMSR		Dual 4-Input OR Gate, Rad Hard	3323
C	CD4072BQBR	JM38510R17102BTC	Dual 4-Input OR Gate, Rad Hard	Note 1

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	CD4073BDMSH		Triple 3-Input AND Gate, Rad Hard	3324
N	CD4073BDMSR		Triple 3-Input AND Gate, Rad Hard	3324
C	CD4073B/3A		Triple 3-Input AND Gate	7012
C	CD4073BFB	JM38510/17003BCA	Triple 3-Input AND Gate	Note 1
C	CD4073BFBR	JM38510R17003BCA	Triple 3-Input AND Gate, Rad Hard	Note 1
N	CD4073BFMSH		Triple 3-Input AND Gate, Rad Hard	3324
N	CD4073BFMSR		Triple 3-Input AND Gate, Rad Hard	3324
N	CD4073BKMSH		Triple 3-Input AND Gate, Rad Hard	3324
N	CD4073BKMSR		Triple 3-Input AND Gate, Rad Hard	3324
C	CD4073BQBR	JM38510R17003BTC	Triple 3-Input AND Gate, Rad Hard	Note 1
N	CD4075BD3		Triple 3-Input OR Gate, Weldseal DIC	7012
N	CD4075BDMSH		Triple 3-Input OR Gate, Rad Hard	3323
N	CD4075BDMSR		Triple 3-Input OR Gate, Rad Hard	3323
C	CD4075B/3A		Triple 3-Input OR Gate	7012
C	CD4075BFB	JM38510/17103BCA	Triple 3-Input OR Gate	Note 1
C	CD4075BFBH	JM38510H17103BCA	Triple 3-Input OR Gate, Rad Hard	Note 1
C	CD4075BFBR	JM38510R17103BCA	Triple 3-Input OR Gate, Rad Hard	Note 1
N	CD4075BFMSH		Triple 3-Input OR Gate, Rad Hard	3323
N	CD4075BFMSR		Triple 3-Input OR Gate, Rad Hard	3323
C	CD4075BFSH	JM38510H17103SCA	Triple 3-Input OR Gate, Rad Hard	Note 1
C	CD4075BFSR	JM38510R17103SCA	Triple 3-Input OR Gate, Rad Hard	Note 1
N	CD4075BK3		Triple 3-Input OR Gate, Weldseal Flatpack	7012
N	CD4075BKMSH		Triple 3-Input OR Gate, Rad Hard	3323
N	CD4075BKMSR		Triple 3-Input OR Gate, Rad Hard	3323
C	CD4075BQBH	JM38510H17103BTC	Triple 3-Input OR Gate, Rad Hard	Note 1
C	CD4075BQBR	JM38510R17103BTC	Triple 3-Input OR Gate, Rad Hard	Note 1
C	CD4075BQSH	JM38510H17103STC	Triple 3-Input OR Gate, Rad Hard	Note 1
C	CD4075BQSR	JM38510R17103STC	Triple 3-Input OR Gate, Rad Hard	Note 1
N	CD4076BDMSH		4-Bit D Flip-Flop, Three-State Outputs, Rad Hard	3325
N	CD4076BDMSR		4-Bit D Flip-Flop, Three-State Outputs, Rad Hard	3325
C	CD4076B/3A		4-Bit D Flip-Flop, Three-State Outputs	7012
N	CD4076BFMSH		4-Bit D Flip-Flop, Three-State Outputs, Rad Hard	3325
N	CD4076BFMSR		4-Bit D Flip-Flop, Three-State Outputs, Rad Hard	3325
N	CD4076BKMSH		4-Bit D Flip-Flop, Three-State Outputs, Rad Hard	3325
N	CD4076BKMSR		4-Bit D Flip-Flop, Three-State Outputs, Rad Hard	3325
N	CD4077BDMSH		Quad Exclusive NOR Gate, Rad Hard	3322
N	CD4077BDMSR		Quad Exclusive NOR Gate, Rad Hard	3322
C	CD4077B/3A		Quad Exclusive NOR Gate	7012
C	CD4077BFBR	JM38510R17204BCA	Quad Exclusive NOR Gate, Rad Hard	Note 1
N	CD4077BFMSH		Quad Exclusive NOR Gate, Rad Hard	3322
N	CD4077BFMSR		Quad Exclusive NOR Gate, Rad Hard	3322
N	CD4077BKMSH		Quad Exclusive NOR Gate, Rad Hard	3322
N	CD4077BKMSR		Quad Exclusive NOR Gate, Rad Hard	3322
C	CD4077BQBR	JM38510R17204BTC	Quad Exclusive NOR Gate, Rad Hard	Note 1
N	CD4078BDMSH		8-Bit NOR/OR Gate, Rad Hard	3326
N	CD4078BDMSR		8-Bit NOR/OR Gate, Rad Hard	3326
C	CD4078B/3A	7704402CA	8-Bit NOR/OR Gate, Dual Brand	7012
N	CD4078BFMSH		8-Bit NOR/OR Gate, Rad Hard	3326
N	CD4078BFMSR		8-Bit NOR/OR Gate, Rad Hard	3326
N	CD4078BKMSH		8-Bit NOR/OR Gate, Rad Hard	3326

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	CD4078BKMSR		8-Bit NOR/OR Gate, Rad Hard	3326
N	CD4081BD3		Quad 2-Input AND Gate, Weldseal DIC	7012
N	CD4081BDMSH		Quad 2-Input AND Gate, Rad Hard	3324
N	CD4081BDMSR		Quad 2-Input AND Gate, Rad Hard	3324
C	CD4081B/3A	7702402CA	Quad 2-Input AND Gate, Dual Brand	7012
C	CD4081BFB	JM38510/17001BCA	Quad 2-Input AND Gate	Note 1
C	CD4081BFBH	JM38510R17204BTC	Quad 2-Input AND Gate, Rad Hard	Note 1
C	CD4081BFBR	JM38510R17001BCA	Quad 2-Input AND Gate, Rad Hard	Note 1
N	CD4081BFMSH		Quad 2-Input AND Gate, Rad Hard	3324
N	CD4081BFMSR		Quad 2-Input AND Gate, Rad Hard	3324
C	CD4081BFSH	JM38510H17001SCA	Quad 2-Input AND Gate, Rad Hard	Note 1
C	CD4081BFSR	JM38510R17001SCA	Quad 2-Input AND Gate, Rad Hard	Note 1
N	CD4081BK3		Quad 2-Input AND Gate, Weldseal FP, Field Programmable	7012
N	CD4081BKMSH		Quad 2-Input AND Gate, Rad Hard	3324
N	CD4081BKMSR		Quad 2-Input AND Gate, Rad Hard	3324
C	CD4081BQBH	JM38510H17001BTC	Quad 2-Input AND Gate, Rad Hard	Note 1
C	CD4081BQBR	JM38510R17001BTC	Quad 2-Input AND Gate, Rad Hard	Note 1
C	CD4081BQSH	JM38510H17001STC	Quad 2-Input AND Gate, Rad Hard	Note 1
C	CD4081BQSR	JM38510R17001STC	Quad 2-Input AND Gate, Rad Hard	Note 1
N	CD4082BDMSH		Dual 4-Input AND Gate, Rad Hard	3324
N	CD4082BDMSR		Dual 4-Input AND Gate, Rad Hard	3324
C	CD4082B/3A	7705902CA	Dual 4-Input AND Gate, Dual Brand	7012
C	CD4082BFB	JM38510/17002BCA	Dual 4-Input AND Gate	Note 1
C	CD4082BFBR	JM38510R17002BCA	Dual 4-Input AND Gate, Rad Hard	Note 1
N	CD4082BFMSH		Dual 4-Input AND Gate, Rad Hard	3324
N	CD4082BFMSR		Dual 4-Input AND Gate, Rad Hard	3324
N	CD4082BKMSH		Dual 4-Input AND Gate, Rad Hard	3324
N	CD4082BKMSR		Dual 4-Input AND Gate, Rad Hard	3324
C	CD4082BQBR	JM38510R17002BTC	Dual 4-Input AND Gate, Rad Hard	Note 1
N	CD4085BDMSH		Dual 2-Wide 2-Input AND/OR/Invert (AOI) Gate, Rad Hard	3327
N	CD4085BDMSR		Dual 2-Wide 2-Input AND/OR/Invert (AOI) Gate, Rad Hard	3327
C	CD4085B/3A		Dual 2-Wide 2-Input AND/OR/Invert (AOI) Gate	7012
C	CD4085BFBH	JM38510H17201BCA	Dual 2-Wide 2-Input AND/OR/Invert (AOI) Gate, Rad Hard	Note 1
C	CD4085BFBR	JM38510R17201BCA	Dual 2-Wide 2-Input AND/OR/Invert (AOI) Gate, Rad Hard	Note 1
N	CD4085BFMSH		Dual 2-Wide 2-Input AND/OR/Invert (AOI) Gate, Rad Hard	3327
N	CD4085BFMSR		Dual 2-Wide 2-Input AND/OR/Invert (AOI) Gate, Rad Hard	3327
C	CD4085BFSH	JM38510H17201SCA	Dual 2-Wide 2-Input AND/OR/Invert (AOI) Gate, Rad Hard	Note 1
C	CD4085BFSR	JM38510R17201SCA	Dual 2-Wide 2-Input AND/OR/Invert (AOI) Gate, Rad Hard	Note 1
N	CD4085BKMSH		Dual 2-Wide 2-Input AND/OR/Invert (AOI) Gate, Rad Hard	3327
N	CD4085BKMSR		Dual 2-Wide 2-Input AND/OR/Invert (AOI) Gate, Rad Hard	3327
C	CD4085BQBH	JM38510H17201BTC	Dual 2-Wide 2-Input AND/OR/Invert (AOI) Gate, Rad Hard	Note 1
C	CD4085BQBR	JM38510R17201BTC	Dual 2-Wide 2-Input AND/OR/Invert (AOI) Gate, Rad Hard	Note 1
C	CD4085BQSH	JM38510H17201STC	Dual 2-Wide 2-Input AND/OR/Invert (AOI) Gate, Rad Hard	Note 1
C	CD4085BQSR	JM38510R17201STC	Dual 2-Wide 2-Input AND/OR/Invert (AOI) Gate, Rad Hard	Note 1
N	CD4086BDMSR		4-Wide 2-Input AND/OR/Invert Gate, Rad Hard	3328
C	CD4086B/3A		4-Wide 2-Input AND/OR/Invert Gate	7012
C	CD4086BFBH	JM38510H17202BCA	4-Wide 2-Input AND/OR/Invert Gate, Rad Hard	Note 1
C	CD4086BFBR	JM38510R17202BCA	4-Wide 2-Input AND/OR/Invert Gate, Rad Hard	Note 1
N	CD4086BFMSH		4-Wide 2-Input AND/OR/Invert Gate, Rad Hard	3328

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	CD4086BFMSR		4-Wide 2-Input AND/OR/Invert Gate, Rad Hard	3328
C	CD4086BFSH	JM38510H17202SCA	4-Wide 2-Input AND/OR/Invert Gate, Rad Hard	Note 1
C	CD4086BFSR	JM38510R17202SCA	4-Wide 2-Input AND/OR/Invert Gate, Rad Hard	Note 1
N	CD4086BKMSH		4-Wide 2-Input AND/OR/Invert Gate, Rad Hard	3328
N	CD4086BKMSR		4-Wide 2-Input AND/OR/Invert Gate, Rad Hard	3328
C	CD4086BQBH	JM38510H17202BTC	4-Wide 2-Input AND/OR/Invert Gate, Rad Hard	Note 1
C	CD4086BQBR	JM38510R17202BTC	4-Wide 2-Input AND/OR/Invert Gate, Rad Hard	Note 1
C	CD4086BQSH	JM38510H17202STC	4-Wide 2-Input AND/OR/Invert Gate, Rad Hard	Note 1
C	CD4086BQSR	JM38510R17202STC	4-Wide 2-Input AND/OR/Invert Gate, Rad Hard	Note 1
N	CD4089BDMSH		Binary Rate Multiplier, Rad Hard	3329
N	CD4089BDMSR		Binary Rate Multiplier, Rad Hard	3329
C	CD4089B/3A		Binary Rate Multiplier	7012
N	CD4089BFMSH		Binary Rate Multiplier, Rad Hard	3329
N	CD4089BFMSR		Binary Rate Multiplier, Rad Hard	3329
N	CD4089BKMSH		Binary Rate Multiplier, Rad Hard	3329
N	CD4089BKMSR		Binary Rate Multiplier, Rad Hard	3329
N	CD4093BD3		Quad 2-Input NAND Schmitt Trigger, Weldseal DIC	7012
N	CD4093BDMSH		Quad 2-Input NAND Schmitt Trigger, Rad Hard	3330
N	CD4093BDMSR		Quad 2-Input NAND Schmitt Trigger, Rad Hard	3330
C	CD4093B/3A	7704602CA	Quad 2-Input NAND Schmitt Trigger, Dual Brand	7012
N	CD4093BFMSH		Quad 2-Input NAND Schmitt Trigger, Rad Hard	3330
N	CD4093BFMSR		Quad 2-Input NAND Schmitt Trigger, Rad Hard	3330
N	CD4093BKMSH		Quad 2-Input NAND Schmitt Trigger, Rad Hard	3330
N	CD4093BKMSR		Quad 2-Input NAND Schmitt Trigger, Rad Hard	3330
N	CD4094BD3		8-Stage Shift-and-Store Bus Register, Weldseal DIC	7012
N	CD4094BDMSH		8-Stage Shift-and-Store Bus Register, Rad Hard	3194
N	CD4094BDMSR		8-Stage Shift-and-Store Bus Register, Rad Hard	3194
C	CD4094B/3A	7702501EA	8-Stage Shift-and-Store Bus Register, Dual Brand	7012
N	CD4094BFMSH		8-Stage Shift-and-Store Bus Register, Rad Hard	3194
N	CD4094BFMSR		8-Stage Shift-and-Store Bus Register, Rad Hard	3194
N	CD4094BKMSH		8-Stage Shift-and-Store Bus Register, Rad Hard	3194
N	CD4094BKMSR		8-Stage Shift-and-Store Bus Register, Rad Hard	3194
N	CD4095BDMSH		Gated J-K Flip-Flop, Non-Inverting, Rad Hard	3331
N	CD4095BDMSR		Gated J-K Flip-Flop, Non-Inverting, Rad Hard	3331
C	CD4095B/3A		Gated J-K Flip-Flop, Non-Inverting	7012
N	CD4095BFMSH		Gated J-K Flip-Flop, Non-Inverting, Rad Hard	3331
N	CD4095BFMSR		Gated J-K Flip-Flop, Non-Inverting, Rad Hard	3331
N	CD4095BKMSH		Gated J-K Flip-Flop, Non-Inverting, Rad Hard	3331
N	CD4095BKMSR		Gated J-K Flip-Flop, Non-Inverting, Rad Hard	3331
N	CD4096BDMSH		Gated J-K Flip-Flop, Inverting and Non-Inverting, Rad Hard	3331
N	CD4096BDMSR		Gated J-K Flip-Flop, Inverting and Non-Inverting, Rad Hard	3331
N	CD4096BFMSH		Gated J-K Flip-Flop, Inverting and Non-Inverting, Rad Hard	3331
N	CD4096BFMSR		Gated J-K Flip-Flop, Inverting and Non-Inverting, Rad Hard	3331
N	CD4096BKMSH		Gated J-K Flip-Flop, Inverting and Non-Inverting, Rad Hard	3331
N	CD4096BKMSR		Gated J-K Flip-Flop, Inverting and Non-Inverting, Rad Hard	3331
N	CD4097BDMSH		8-Channel Analog MUX/DeMUX, Rad Hard	3190
N	CD4097BDMSR		8-Channel Analog MUX/DeMUX, Rad Hard	3190
N	CD4097BFMSR		8-Channel Analog MUX/DeMUX, Rad Hard	3190
N	CD4097BKMSH		8-Channel Analog MUX/DeMUX, Rad Hard	3190
N	CD4097BKMSR		8-Channel Analog MUX/DeMUX, Rad Hard	3190

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PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	CD4098BD3		Dual Monostable Multivibrator, Weldseal DIC	7012
N	CD4098BDMSH		Dual Monostable Multivibrator, Rad Hard	3332
N	CD4098BDMSR		Dual Monostable Multivibrator, Rad Hard	3332
C	CD4098B/3A		Dual Monostable Multivibrator	7012
C	CD4098BFB	JM38510/17504BEA	Dual Monostable Multivibrator	Note 1
C	CD4098BFBR	JM38510R17504BEA	Dual Monostable Multivibrator, Rad Hard	Note 1
N	CD4098BFMSH		Dual Monostable Multivibrator, Rad Hard	3332
N	CD4098BFMSR		Dual Monostable Multivibrator, Rad Hard	3332
N	CD4098BK3		Dual Monostable Multivibrator, Weldseal FP, Field Programmable	7012
N	CD4098BKMSH		Dual Monostable Multivibrator, Rad Hard	3332
N	CD4098BKMSR		Dual Monostable Multivibrator, Rad Hard	3332
C	CD4098BQBR	JM38510R17504BNC	Dual Monostable Multivibrator, Rad Hard	Note 1
N	CD4099BDMSH		8-Bit Addressable Latch, Rad Hard	3333
N	CD4099BDMSR		8-Bit Addressable Latch, Rad Hard	3333
C	CD4099B/3A		8-Bit Addressable Latch	7012
C	CD4099BFB	JM38510/17601BEA	8-Bit Addressable Latch	Note 1
C	CD4099BFBR	JM38510R17601BEA	8-Bit Addressable Latch, Rad Hard	Note 1
N	CD4099BFMSH		8-Bit Addressable Latch, Rad Hard	3333
N	CD4099BFMSR		8-Bit Addressable Latch, Rad Hard	3333
N	CD4099BK3		8-Bit Addressable Latch, Weldseal FP, Field Programmable	7012
N	CD4099BKMSH		8-Bit Addressable Latch, Rad Hard	3333
N	CD4099BKMSR		8-Bit Addressable Latch, Rad Hard	3333
C	CD4099BQBR	JM38510R17601BNC	8-Bit Addressable Latch, Rad Hard	Note 1
N	CD4502BD3		Strobed Hex Inverter/Buffer, Weldseal DIC	7012
N	CD4502BDMSH		Strobed Hex Inverter/Buffer, Rad Hard	3334
N	CD4502BDMSR		Strobed Hex Inverter/Buffer, Rad Hard	3334
C	CD4502B/3A	7702002EA	Strobed Hex Inverter/Buffer, Dual Brand	7012
C	CD4502BFB	JM38510/17403BEA	Strobed Hex Inverter/Buffer	Note 1
C	CD4502BFBR	JM38510R17403BEA	Strobed Hex Inverter/Buffer, Rad Hard	Note 1
N	CD4502BFMSH		Strobed Hex Inverter/Buffer, Rad Hard	3334
N	CD4502BFMSR		Strobed Hex Inverter/Buffer, Rad Hard	3334
C	CD4502BFSR	JM38510R17403SEA	Strobed Hex Inverter/Buffer, Rad Hard	Note 1
N	CD4502BKMSH		Strobed Hex Inverter/Buffer, Rad Hard	3334
N	CD4502BKMSR		Strobed Hex Inverter/Buffer, Rad Hard	3334
C	CD4502BQBR	JM38510R17403BNC	Strobed Hex Inverter/Buffer, Rad Hard	Note 1
C	CD4502BQSR	JM38510R17403SNC	Strobed Hex Inverter/Buffer, Rad Hard	Note 1
N	CD4503BD3		Hex Buffer, Non-Inverting, Weldseal DIC	7012
N	CD4503BDMSH		Hex Buffer, Non-Inverting, Rad Hard	3335
N	CD4503BDMSR		Hex Buffer, Non-Inverting, Rad Hard	3335
C	CD4503B/3A		Hex Buffer, Non-Inverting	7012
N	CD4503BFMSH		Hex Buffer, Non-Inverting, Rad Hard	3335
N	CD4503BFMSR		Hex Buffer, Non-Inverting, Rad Hard	3335
N	CD4503BKMSH		Hex Buffer, Non-Inverting, Rad Hard	3335
N	CD4503BKMSR		Hex Buffer, Non-Inverting, Rad Hard	3335
N	CD4504BDMSH		Hex Voltage-Level Shifter For TTL-to-CMOS or CMOS-to-CMOS, Rad Hard	3336
N	CD4504BDMSR		Hex Voltage-Level Shifter For TTL-to-CMOS or CMOS-to-CMOS, Rad Hard	3336

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	CD4504B/3A		Hex Voltage-Level Shifter For TTL-to-CMOS or CMOS-to-CMOS	7012
N	CD4504BFMSH		Hex Voltage-Level Shifter For TTL-to-CMOS or CMOS-to-CMOS, Rad Hard	3336
N	CD4504BFMSR		Hex Voltage-Level Shifter For TTL-to-CMOS or CMOS-to-CMOS, Rad Hard	3336
N	CD4504BKMSH		Hex Voltage-Level Shifter For TTL-to-CMOS or CMOS-to-CMOS, Rad Hard	3336
N	CD4504BKMSR		Hex Voltage-Level Shifter For TTL-to-CMOS or CMOS-to-CMOS, Rad Hard	3336
N	CD4508BD3		Dual 4-Bit Latch, Weldseal DIC	7012
N	CD4508BDMSH		Dual 4-Bit Latch, Rad Hard	3337
N	CD4508BDMSR		Dual 4-Bit Latch, Rad Hard	3337
C	CD4508B/3A		Dual 4-Bit Latch	7012
N	CD4508BFMSH		Dual 4-Bit Latch, Rad Hard	3337
N	CD4508BFMSR		Dual 4-Bit Latch, Rad Hard	3337
N	CD4508BKMSH		Dual 4-Bit Latch, Rad Hard	3337
N	CD4508BKMSR		Dual 4-Bit Latch, Rad Hard	3337
N	CD4510BDMSH		Presettable 4-Bit BCD Up/Down Counter, Rad Hard	3338
N	CD4510BDMSR		Presettable 4-Bit BCD Up/Down Counter, Rad Hard	3338
C	CD4510B/3A		Presettable Up/Down Counter	7012
N	CD4510BFMSH		Presettable 4-Bit BCD Up/Down Counter, Rad Hard	3338
N	CD4510BFMSR		Presettable 4-Bit BCD Up/Down Counter, Rad Hard	3338
N	CD4510BKMSH		Presettable 4-Bit BCD Up/Down Counter, Rad Hard	3338
N	CD4510BKMSR		Presettable 4-Bit BCD Up/Down Counter, Rad Hard	3338
N	CD4511BD3		BCD-to-7 Segment Latch Decoder/Driver, Weldseal DIC	7012
N	CD4511BDMSH		BCD-to-7 Segment Latch Decoder/Driver, Rad Hard	3339
N	CD4511BDMSR		BCD-to-7 Segment Latch Decoder/Driver, Rad Hard	3339
C	CD4511B/3A		BCD-to-7 Segment Latch Decoder/Driver	7012
N	CD4511BFMSH		BCD-to-7 Segment Latch Decoder/Driver, Rad Hard	3339
N	CD4511BFMSR		BCD-to-7 Segment Latch Decoder/Driver, Rad Hard	3339
N	CD4511BK3		BCD-to-7 Segment Latch Decoder/Driver, Field Programmable	7012
N	CD4511BKMSH		BCD-to-7 Segment Latch Decoder/Driver, Rad Hard	3339
N	CD4511BKMSR		BCD-to-7 Segment Latch Decoder/Driver, Rad Hard	3339
N	CD4512BDMSH		8-Channel Data Selector, Three-State Output, Rad Hard	3340
N	CD4512BDMSR		8-Channel Data Selector, Three-State Output, Rad Hard	3340
C	CD4512B/3A		8-Channel Data Selector, Three-State Output	7012
N	CD4512BFMSH		8-Channel Data Selector, Three-State Output, Rad Hard	3340
N	CD4512BFMSR		8-Channel Data Selector, Three-State Output, Rad Hard	3340
N	CD4512BKMSH		8-Channel Data Selector, Three-State Output, Rad Hard	3340
N	CD4512BKMSR		8-Channel Data Selector, Three-State Output, Rad Hard	3340
N	CD4514BD3		4-Bit Latch/4-to-16 Line Decoder, Outputs Low, Weldseal DIC	7012
N	CD4514BDMSH		4-Bit Latch/4-to-16 Line Decoder, Outputs Low, Rad Hard	3195
N	CD4514BDMSR		4-Bit Latch/4-to-16 Line Decoder, Outputs Low, Rad Hard	3195
C	CD4514B/3A		4-Bit Latch/4-to-16 Line Decoder, Outputs Low	7012
N	CD4514BFMSR		4-Bit Latch/4-to-16 Line Decoder, Outputs Low, Rad Hard	3195
N	CD4514BKMSH		4-Bit Latch/4-to-16 Line Decoder, Outputs Low, Rad Hard	3195
N	CD4514BKMSR		4-Bit Latch/4-to-16 Line Decoder, Outputs Low, Rad Hard	3195

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PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	CD4515BD3		4-Bit Latch/4-to-16 Line Decoder, Outputs Low, Weldseal DIC	7012
N	CD4515BDMSH		4-Bit Latch/4-to-16 Line Decoder, Outputs Low, Rad Hard	3195
N	CD4515BDMSR		4-Bit Latch/4-to-16 Line Decoder, Outputs Low, Rad Hard	3195
C	CD4515B/3A	7703201JA	4-Bit Latch/4-to-16 Line Decoder, Outputs Low	7012
N	CD4515BFMSR		4-Bit Latch/4-to-16 Line Decoder, Outputs Low, Rad Hard	3195
N	CD4515BKMSH		4-Bit Latch/4-to-16 Line Decoder, Outputs Low, Rad Hard	3195
N	CD4515BKMSR		4-Bit Latch/4-to-16 Line Decoder, Outputs Low, Rad Hard	3195
N	CD4516BD3		Presettable 4-Bit Binary Up/Down Counter, Weldseal DIC	7012
N	CD4516BDMSH		Presettable 4-Bit Binary Up/Down Counter, Rad Hard	3338
N	CD4516BDMSR		Presettable 4-Bit Binary Up/Down Counter, Rad Hard	3338
C	CD4516B/3A		Presettable 4-Bit Binary Up/Down Counter	7012
N	CD4516BFMSH		Presettable 4-Bit Binary Up/Down Counter, Rad Hard	3338
N	CD4516BFMSR		Presettable 4-Bit Binary Up/Down Counter, Rad Hard	3338
N	CD4516BK3		Presettable 4-Bit Binary Up/Down Counter, Field Programmable	7012
N	CD4516BKMSH		Presettable 4-Bit Binary Up/Down Counter, Rad Hard	3338
N	CD4516BKMSR		Presettable 4-Bit Binary Up/Down Counter, Rad Hard	3338
N	CD4517BDMSH		Rad Hard Dual 64-Bit Shift Register	3341
N	CD4517BDMSR		Rad Hard Dual 64-Bit Shift Register	3341
C	CD4517B/3A		Dual 64-Bit Shift Register	7012
N	CD4517BFMSH		Rad Hard Dual 64-Bit Shift Register	3341
N	CD4517BFMSR		Rad Hard Dual 64-Bit Shift Register	3341
N	CD4517BKMSH		Rad Hard Dual 64-Bit Shift Register	3341
N	CD4517BKMSR		Rad Hard Dual 64-Bit Shift Register	3341
N	CD4518BD3		Dual BCD Up Counter, Weldseal DIC	7012
N	CD4518BDMSH		Rad Hard Dual BCD Up Counter	3342
N	CD4518BDMSR		Rad Hard Dual BCD Up Counter	3342
C	CD4518B/3A		Dual BCD Up Counter	7012
N	CD4518BFMSH		Rad Hard Dual BCD Up Counter	3342
N	CD4518BFMSR		Rad Hard Dual BCD Up Counter	3342
N	CD4518BKMSH		Rad Hard Dual BCD Up Counter	3342
N	CD4518BKMSR		Rad Hard Dual BCD Up Counter	3342
N	CD4520BD3		Dual Binary Up Counter, Weldseal DIC	7012
N	CD4520BDMSH		Rad Hard Dual Binary Up Counter	3342
N	CD4520BDMSR		Rad Hard Dual Binary Up Counter	3342
C	CD4520B/3A	7702301EA	Dual Binary Up Counter, Dual Brand	7012
N	CD4520BFMSH		Rad Hard Dual Binary Up Counter	3342
N	CD4520BFMSR		Rad Hard Dual Binary Up Counter	3342
N	CD4520BKMSH		Rad Hard Dual Binary Up Counter	3342
N	CD4520BKMSR		Rad Hard Dual Binary Up Counter	3342
N	CD4527BDMSH		Rad Hard BCD Rate Multiplier	3343
N	CD4527BDMSR		Rad Hard BCD Rate Multiplier	3343
N	CD4527BFMSH		Rad Hard BCD Rate Multiplier	3343
N	CD4527BFMSR		Rad Hard BCD Rate Multiplier	3343
N	CD4527BKMSH		Rad Hard BCD Rate Multiplier	3343
N	CD4527BKMSR		Rad Hard BCD Rate Multiplier	3343
N	CD4532BD3		8-Input Priority Encoder, Weldseal DIC	7012
N	CD4532BDMSH		Rad Hard 8-Input Priority Encoder	3344
N	CD4532BDMSR		RAd Hard 8-Input Priority Encoder	3344

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PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	CD4532B/3A		8-Input Priority Encoder	7012
N	CD4532BFMSH		Rad Hard 8-Input Priority Encoder	3344
N	CD4532BFMSR		Rad Hard 8-Input Priority Encoder	3344
N	CD4532BKMSH		Rad Hard 8-Input Priority Encoder	3344
N	CD4532BKMSR		Rad Hard 8-Input Priority Encoder	3344
N	CD4536BDMSH		Rad Hard Programmable Timer	3345
N	CD4536BDMSR		Rad Hard Programmable Timer	3345
C	CD4536B/3A		Programmable Timer	7012
N	CD4536BFMSH		Rad Hard Programmable Time	3345
N	CD4536BFMSR		Rad Hard Programmable Timer	3345
N	CD4536BKMSH		Rad Hard Programmable Timer	3345
N	CD4536BKMSR		Rad Hard Programmable Time	3345
C	CD4541B/3A		Programmable Timer	7012
N	CD4555BD3		Dual 1-of-4 Decoder/DeMUX Outputs High, Weldseal DIC	7012
N	CD4555BDMSH		Rad Hard Dual 1-of-4 Decoder/DeMUX, Outputs High	3346
N	CD4555BDMSR		Rad Hard Dual 1-of-4 Decoder/DeMUX, Outputs High	3346
C	CD4555B/3A	7704701EA	Rad Hard Dual 1-of-4 Decoder/DeMUX, Outputs High	7012
N	CD4555BFMSH		Rad Hard Dual 1-of-4 Decoder/DeMUX, Outputs High	3346
N	CD4555BFMSH		Rad Hard Dual 1-of-4 Decoder/DeMUX, Outputs High	3346
N	CD4555BFMSR		Rad Hard Dual 1-of-4 Decoder/DeMUX, Outputs High	3346
N	CD4555BK3		Dual 1-of-4 Decoder/DeMUX, Outputs High, Field Programmable	7012
N	CD4555BKMSH		Rad Hard Dual 1-of-4 Decoder/DeMUX, Outputs High	3346
N	CD4555BKMSR		Rad Hard Dual 1-of-4 Decoder/DeMUX, Outputs High	3346
N	CD4556BDMSH		Rad Hard Dual 1-of-4 Decoder/DeMUX, Outputs Low	3346
N	CD4556BDMSR		Rad Hard Dual 1-of-4 Decoder/DeMUX, Outputs Low	3346
C	CD4556B/3A	7704801EA	Dual 1-of-4 Decoder/DeMUX, Outputs Low, Dual Brand	7012
N	CD4556BFMSH		Rad Hard Dual 1-of-4 Decoder/DeMUX, Outputs Low	3346
N	CD4556BFMSR		Rad Hard Dual 1-of-4 Decoder/DeMUX, Outputs Low	3346
N	CD4556BKMSH		Rad Hard Dual 1-of-4 Decoder/DeMUX, Outputs Low	3346
N	CD4556BKMSR		Rad Hard Dual 1-of-4 Decoder/DeMUX, Outputs Low	3346
N	CD4585BD3		4-Bit Magnitude Comparator, Weldseal DIC	7012
N	CD4585BDMSH		Rad Hard 4-Bit Magnitude Comparator	3347
N	CD4585BDMSR		Rad Hard 4-Bit Magnitude Comparator	3347
C	CD4585B/3A	7703702EA	Rad Hard 4-Bit Magnitude Comparator	7012
N	CD4585BFMSH		Rad Hard 4-Bit Magnitude Comparator	3347
N	CD4585BFMSR		Rad Hard 4-Bit Magnitude Comparator	3347
N	CD4585BKMSH		Rad Hard 4-Bit Magnitude Comparator	3347
N	CD4585BKMSR		Rad Hard 4-Bit Magnitude Comparator	3347
N	CD4724BDMSH		Rad Hard 8-Bit Addressable Latch	3348
N	CD4724BDMSR		Rad Hard 8-Bit Addressable Latch	3348
C	CD4724B/3A		8-Bit Addressable Latch	7012
N	CD4724BFMSH		Rad Hard 8-Bit Addressable Latch	3348
N	CD4724BFMSR		Rad Hard 8-Bit Addressable Latch	3348
N	CD4724BKMSH		Rad Hard 8-Bit Addressable Latch	3348
N	CD4724BKMSR		Rad Hard 8-Bit Addressable Latch	3348
C	CD54AC00/3A		Quad 2-Input NAND Gate	3876
C	CD54AC02/3A		Quad 2-Input NOR Gate	3877
C	CD54AC04/3A		Hex Inverter/Buffer	3878

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	CD54AC05/3A		Hex Inverter/Buffer with Open Drain	3879
C	CD54AC08/3A		Quad 2-Input AND Gate	3880
C	CD54AC109/3A		Dual J-K Flip-Flop with Set and Reset +Trigger	3885
C	CD54AC112/3A		Dual J-K Flip-Flop with Set and Reset -Trigger	3886
C	CD54AC138/3A		3-to-8 Decoder/DeMUX, Inverting	3887
C	CD54AC139/3A		Dual 2-to-4 Line Decoder/DeMUX	3888
C	CD54AC153/3A		Dual 4-Input MUX	3890
C	CD54AC157/3A		Quad 2-Input MUX	3891
C	CD54AC161/3A		Presettable Synchronous 4-Bit Counter, Asynchronous Reset	3892
C	CD54AC163/3A		Presettable Synchronous 4-Bit Counter, Synchronous Reset	3893
C	CD54AC164/3A		8-Bit Serial In/Parallel Out Shift Register	3894
C	CD54AC191/3A		Presettable Synchronous 4-Bit Up/Down Counter	3896
C	CD54AC193/3A		Presettable Synchronous 4-Bit Up/Down Counter	3897
C	CD54AC240/3A		Octal Buffer/Line Driver, Three-State Inverting	3898
C	CD54AC244/3A		Octal Buffer/Line Driver, Three-State	3900
C	CD54AC245/3A		Octal Transceiver, Three-State	3901
C	CD54AC257/3A		Quad 2-Input MUX, Three-State, Non-Inverting	3903
C	CD54AC273/3A		Octal D Flip-Flop with Reset, +Trigger	3904
C	CD54AC280/3A		9-Bit Odd/Even Parity Generator Checker	3905
C	CD54AC283/3A		4-Bit Full Adder with Fast Carry	3906
C	CD54AC299/3A		8-Bit Shift/Storage Register Three-State, Asynchronous Reset	3907
C	CD54AC32/3A		Quad 2-Input OR Gate	3882
C	CD54AC373/3A		Octal Transparent Latch, Three-State	3909
C	CD54AC374/3A		Octal D Type Flip-Flop, with +Trigger	3910
C	CD54AC534/3A		Octal D Type Flip-Flop, with +Trigger Inverting	3912
C	CD54AC541/3A		Octal Buffer/Line Driver, Three-State	3914
C	CD54AC573/3A		Octal Transparent Latch, Three-State	3915
C	CD54AC574/3A		Octal D Type Flip-Flop, with +Trigger	3916
C	CD54AC74/3A		Dual D Flip-Flop, with S and R, +Trigger	3883
C	CD54ACT00/3A		Quad 2-Input NAND Gate	3876
C	CD54ACT02/3A		Quad 2-Input NOR Gate	3877
C	CD54ACT04/3A		Hex Inverter/Buffer	3878
C	CD54ACT05/3A		Hex Inverter/Buffer with Open Drain	3879
C	CD54ACT08/3A		Quad 2-Input AND Gate	3880
C	CD54ACT109/3A		Dual J-K Flip-Flop with Set and Reset +Trigger	3885
C	CD54ACT112/3A		Dual J-K Flip-Flop with Set and Reset -Trigger	3886
C	CD54ACT138/3A		3-to-8 Decoder/DeMUX, Inverting	3887
C	CD54ACT139/3A		Dual 2-to-4 Line Decoder/DeMUX	3888
C	CD54ACT151/3A		8 Input MUX	3889
C	CD54ACT153/3A		Dual 4-Input MUX	3890
C	CD54ACT161/3A		Presettable Synchronous 4-Bit Counter, Asynchronous Reset	3892
C	CD54ACT163/3A		Presettable Synchronous 4-Bit Counter, Synchronous Reset	3893
C	CD54ACT164/3A		8-Bit Serial In/Parallel Out Shift Register	3894
C	CD54ACT174/3A		Hex D Type Flip-Flop, with Reset +Trigger	3895
C	CD54ACT191/3A		Presettable Synchronous 4-Bit Up/Down Counter	3896
C	CD54ACT193/3A		Presettable Synchronous 4-Bit Up/Down Counter	3897

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	CD54ACT20/3A		Dual 4-Input NAND Gate	3881
C	CD54ACT240/3A		Octal Buffer/Line Driver, Three-State Inverting	3898
C	CD54ACT241/3A		Octal Buffer/Line Driver, Three-State	3899
C	CD54ACT244/3A		Octal Buffer/Line Driver, Three-State	3900
C	CD54ACT245/3A		Octal Transceiver, Three-State	3901
C	CD54ACT253/3A		Dual 4-Input MUX, Three-State	3902
C	CD54ACT257/3A		Quad 2-Input MUX, Three-State, Non-Inverting	3903
C	CD54ACT273/3A		Octal D Flip-Flop with Reset, +Trigger	3904
C	CD54ACT280/3A		9-Bit Odd/Even Parity Generator Checker	3905
C	CD54ACT283/3A		4-Bit Full Adder with Fast Carry	3906
C	CD54ACT299/3A		8-Bit Shift/Storage Register Three-State, Asynchronous Reset	3907
C	CD54ACT323/3A		8-Bit Shift/Storage Register Three-State, Synchronous Reset	3908
C	CD54ACT32/3A		Quad 2-Input OR Gate	3882
C	CD54ACT373/3A		Octal Transparent Latch, Three-State	3909
C	CD54ACT374/3A		Octal D Type Flip-Flop, with +Trigger	3910
C	CD54ACT533/3A		Octal Transparent Latch, Three-State, Inverting	3911
C	CD54ACT534/3A		Octal D Type Flip-Flop, with +Trigger Inverting	3912
C	CD54ACT540/3A		Octal Buffer/Line Driver, Three-State	3913
C	CD54ACT541/3A		Octal Buffer/Line Driver, Three-State	3914
C	CD54ACT573/3A		Octal Transparent Latch, Three-State	3915
C	CD54ACT574/3A		Octal D Type Flip-Flop, with +Trigger	3916
C	CD54ACT623/3A		Octal Bus Transceiver, Three-State	3917
C	CD54ACT74/3A		Dual D Flip-Flop, with S and R, +Trigger	3883
C	CD54ACT86/3A		Quad 2-Input Exclusive OR Gate	3884
C	CD54HC00/3A	8403701CA	Quad 2-Input NAND Gate, Dual Brand	3753
C	CD54HC02/3A	8404101CA	Quad 2-Input NOR Gate, Dual Brand	3754
C	CD54HC03/3A	8409801CA	Quad 2-Input NAND Gate, Open Co, Dual Brand	3755
C	CD54HC04/3A	8409301CA	Hex Inverter/Buffer, Dual Brand	3756
C	CD54HC08/3A	8404701CA	Quad 2-Input AND Gate, Dual Brand	3757
C	CD54HC107/3A	5962-8515401CA	Dual J-K Flip-Flop with Reset, Dual Brand	3772
C	CD54HC109/3A	8415001EA	Dual J-K Flip-Flop with Set Reset, Dual Brand	3773
C	CD54HC10/3A	8403801CA	Triple 3-Input NAND Gate, Dual Brand	3758
C	CD54HC11/3A	8404801CA	Triple 3-Input AND Gate, Dual Brand	3759
C	CD54HC123/3A	5962-8684701EA	Dual Retriggerable Monostable. Multivibrator, Dual Brand	3775
C	CD54HC125/3A	5962-8772101CA	Quad Three-State Buffer, Dual Brand	3776
C	CD54HC126/3A	5962-8684801CA	Quad Three-State Buffer, Dual Brand	3777
C	CD54HC132/3A		Quad 2-Input NAND Schmitt Trigger	3778
C	CD54HC138/3A	8406201EA	3-to-8 Line Decoder/DeMUX, Inverting, Dual Brand	3779
C	CD54HC147/3A	8406401EA	10-to-4 Line Priority Encoder, Dual Brand	3781
C	CD54HC14/3A	8409101CA	Hex Inverting Schmitt Trigger, Dual Brand	3760
C	CD54HC154/3A	5962-8682201JA	4-to-16 Line Decoder, Dual Brand	3784
C	CD54HC157/3A	5962-8606101EA	Quad 2-Input MUX, Dual Brand	3785
C	CD54HC158/3A	5962-8682301EA	Quad 2-Input MUX, Inverting, Dual Brand	3786
C	CD54HC160/3A	5962-8682401EA	Synchronous BCD Decade Counter, Dual Brand	3787
C	CD54HC161/3A	8407501EA	Synchronous Presettable 4-Bit Counter, Dual Brand	3788
C	CD54HC162/3A	8409401EA	Synchronous BCD Decade Counter, Dual Brand	3789
C	CD54HC163/3A	8604601EA	Synchronous Presettable 4-Bit Counter, Dual Brand	3790
C	CD54HC164/3A	8416201CA	8-Bit Serial In/Parallel Out Shift Register, Dual Brand	3791

See Section 1 for complete selection guide, page number reference, and file number listing.

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	CD54HC165/3A	8409501EA	8-Bit Parallel In/Serial Out Shift Register, Dual Brand	3792
C	CD54HC166/3A		8-Bit Parallel Shift Register	3793
C	CD54HC173/3A	5962-8682501EA	Quad D-Type Flip-Flop, Dual Brand	3794
C	CD54HC190/3A	5962-8994601EA	Presettable Synchronous BCD Up/Down Counter, Dual Brand	3797
C	CD54HC191/3A	5962-8689101EA	Synchronous 4-Bit Binary Up/Down Counter, Dual Brand	3798
C	CD54HC192/3A	5962-8780801EA	Synchronous BCD Decade U/D Counter, Dual Brand	3799
C	CD54HC193/3A	5962-8772401EA	Synchronous 4-Bit Binary U/D Counter, Dual Brand	3800
C	CD54HC194/3A	5962-8682601EA	4-Bit Bidirectional Universal Shift Register, Dual Brand	3801
C	CD54HC21/3A	5962-8857601CA	Dual 4-Input AND Gate, Dual Brand	3762
C	CD54HC221/3A	5962-8780501EA	Dual Monostable Multivibrator with Reset, Dual Brand	3803
C	CD54HC238/3A	5962-8688401EA	3-to-8 Line Decoder/DeMUX, Dual Brand	3805
C	CD54HC240/3A	8407401RA	Octal Buffer/Line Driver Three-State, Dual Brand	3806
C	CD54HC243/3A	8409001CA	Quad Bus Transceiver, Three-State, Dual Brand	3808
C	CD54HC244/3A	8409001CA	Octal Buffer/Line Driver, Three-State, Dual Brand	3809
C	CD54HC245/3A	8408501RA	Octal Bus Transceiver, Three-State, Dual Brand	3810
C	CD54HC251/3A	8512501EA	8-Input MUX, Three-State, Dual Brand	3811
C	CD54HC253/3A		Dual 4-Input MUX, Three-State	3812
C	CD54HC257/3A	8512401EA	Quad 2-Input MUX, Three-State, Dual Brand	3813
C	CD54HC259/3A	8551901EA	8-Bit Addressable Hatch, Dual Brand	3815
C	CD54HC273/3A	8409901RA	Octal D-Type Flip-Flop with Reset, Dual Brand	3816
C	CD54HC27/3A	8404201CA	Triple 3-Input NOR Gate, Dual Brand	3763
C	CD54HC280/3A	8607701CA	9-Bit Odd/Even Parity Generator Checker, Dual Brand	3817
C	CD54HC283/3A	5962-8976501EA	4-Bit Binary Full Adder with Fast C., Dual Brand	3818
C	CD54HC299/3A	5962-8780601RA	8-Bit Universal Shift Register, Three-State, Dual Brand	3820
C	CD54HC30/3A	8404001CA	8-Input NAND Gate, Dual Brand	3764
C	CD54HC32/3A	8404501CA	Quad 2-Input OR Gate, Dual Brand	3765
C	CD54HC354/3A		8-Input MUX, Latched-Data, Three-State	3821
C	CD54HC356/3A		8-Input MUX, Clock-Latched-Data, Three-State	3822
C	CD54HC365/3A	8500101EA	Hex Buffer/Line Driver, Three-State, Dual Brand	3823
C	CD54HC366/3A	5962-8682801EA	Hex Buffer/Line Driver, Three-State, Inverting, Dual Brand	3824
C	CD54HC367/3A	8500201EA	Hex Buffer/Line Driver, Three-State, Dual Brand	3825
C	CD54HC368/3A	5962-8681201EA	Hex Buffer/Line Driver, Three-State, Inverting, Dual Brand	3826
C	CD54HC373/3A	8407201RA	Octal Transparent Latch, Three-State, Dual Brand	3827
C	CD54HC374/3A	8407101RA	Octal D-Type Flip-Flop, Three-State, Dual Brand	3828
C	CD54HC377/3A	5962-8780701RA	Octal D-Type Flip-Flop. with Data Enable, Dual Brand	3829
C	CD54HC393/3A	8410001CA	Dual 4-Bit Binary Ripple Counter, Dual Brand	3831
C	CD54HC40103/3A	5962-9055301EA	8-Bit Binary Down Counter, Dual Brand	3873
C	CD54HC40105/3A		4-Bit Binary 16 Word FIFO Register	3874
C	CD54HC4015/3A	5962-8995301EA	Dual Brand DESC	3847
C	CD54HC4017/3A	8601101EA	Johnson Decade Counter, with 10 Outputs, Dual Brand	3848
C	CD54HC4020/3A	8500301EA	14-Stage Binary Ripple Counter, Dual Brand	3849
C	CD54HC4024/3A	8601201CA	7-Stage Binary Ripple Counter, Dual Brand	3850
C	CD54HC4040/3A	8500401EA	12-Bit Binary Ripple Counter, Dual Brand	3851
C	CD54HC4046A/3A	5962-8960901EA	Phase-Locked Loop with VCO, Dual Brand	3852
C	CD54HC4049/3A	5962-8681901EA	Hex Inverting High-to-Low Level Shift, Dual Brand	3853
C	CD54HC4050/3A	5962-8682001EA	Hex High-to-Low Level Shifter, Dual Brand	3854
C	CD54HC4051/3A		8-Channel Analog MUX/DeMUX	3855

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	CD54HC4052/3A	5962-8855601EA	Dual 4-Channel Analog MUX/DeMUX, Dual Brand	3856
C	CD54HC4053/3A	5962-8775401EA	Triple 2-Channel Analog MUX/DeMUX, Dual Brand	3857
C	CD54HC4060/3A	5962-8768001EA	14-Stage Binary Ripple Counter, Dual Brand	3859
C	CD54HC4066/3A		Quad Bilateral Switch	3860
C	CD54HC4094/3A		8-Stage Shift-and-Store Bus Register	3862
C	CD54HC4316/3A		Quad Analog Switch	3863
C	CD54HC4351/3A		Analog MUX with Latch	3864
C	CD54HC4511/3A	5962-8773301EA	BCD-To-7 Segment Latch/Decoder/Driver, Dual Brand	3865
C	CD54HC4514/3A		4-to-16 Line Decoder/DeMUX with Input Latch	3866
C	CD54HC4515/3A		4-to-16 Line Decoder with Input Latch	3867
C	CD54HC4516/3A		Up/Down Binary Counter	3868
C	CD54HC4520/3A	5962-8995401EA	Dual Up-Counter, Dual Brand	3869
C	CD54HC4538/3A	5962-8688601EA	Dual Retriggerable Precision Monostable Multivibrator, Dual Brand	3870
C	CD54HC533/3A	5962-8681301RA	Octal Transparent Latch, Three-State, Dual Brand	3833
C	CD54HC534/3A	5962-8681401RA	Octal D-Type Flip-Flop, Three-State, Dual Brand	3834
C	CD54HC540/3A		Octal Buffer/Line Driver Three-State, Inverting	3835
C	CD54HC541/3A		Octal Buffer/Line Driver, Three-State	3836
C	CD54HC563/3A	5962-8606201RA	Octal Transparent Latch, Three-State, Dual Brand	3837
C	CD54HC564/3A	5962-8681501RA	Octal D-Type Flip-Flop, Three-State, Dual Brand	3838
C	CD54HC573/3A	8512801RA	Octal Transparent Latch, Three-State, Dual Brand	3839
C	CD54HC574/3A		Octal D Flip-Flop, Three-State	3840
C	CD54HC597/3A	5962-8681701EA	8-Bit Shift Ref. with I/P Latch, Dual Brand	3841
C	CD54HC640/3A	5962-8780901RA	Octal Bus Transceiver, Three-State Inverting, Dual Brand	3842
C	CD54HC646/3A	5962-8688501JA	Octal Bus Transceiver/Register, Three-State, Dual Brand	3843
C	CD54HC670/3A		4 x 4 Register File, Three-State	3844
C	CD54HC688/3A	5962-8681801RA	8-Bit Magnitude Comparator, Dual Brand	3845
C	CD54HC7266/3A	8404302CA	Quad Exclusive NOR, Dual Brand	3871
C	CD54HC73/3A	5962-8515301CA	Dual J-K Flip-Flop with Reset, Dual Brand	3767
C	CD54HC74/3A	8405601CA	Dual D Flip-Flop with Set and Reset, Dual Brand	3768
C	CD54HC75/3A	8407001EA	Quad Bistable Transparent Latch, Dual Brand	3769
C	CD54HC85/3A	8601301EA	4-Bit Magnitude Comparator, Dual Brand	3770
C	CD54HC86/3A	8404601CA	Quad 2-Input Exclusive OR Gate, Dual Brand	3771
C	CD54HCT00/3A	5962-8683101CA	Quad 2-Input NAND Gate, Dual Brand	3753
C	CD54HCT02/3A	5962-8975101CA	Quad 2-Input NAND Gate, Dual Brand	3754
C	CD54HCT03/3A		Quad 2-Input NAND, Open Collector	3754
C	CD54HCT04/3A	5962-8974701CA	Hex Inverter, Dual Brand	3756
C	CD54HCT08/3A	5962-8688301CA	Quad 2-Input AND Gate, Dual Brand	3756
C	CD54HCT109/3A	5962-9070101MEA	Dual J-K Flip-Flop with Set and Reset, Dual Brand	3773
C	CD54HCT10/3A	5962-8984301CA	Triple 3-Input NAND Gate, Dual Brand	3758
C	CD54HCT112/3A	5962-8970201EA	Dual J-K Flip-Flop with Set and Reset, Dual Brand	-
C	CD54HCT11/3A	5962-8970901CA	Triple 3-Input AND Gate, Dual Brand	3759
C	CD54HCT123/3A	5962-8970001EA	Dual Retriggerable Monostable Multivibrator, Dual Brand	3775
C	CD54HCT125/3A		Quad Three-State Buffer	3776
C	CD54HCT126/3A	5962-9065101MCA	Quad Three-State Buffer, Dual Brand	3777
C	CD54HCT132/3A	5962-8984501CA	Quad 2-Input NAND Schmitt Trigger, Dual Brand	3778
C	CD54HCT138/3A	8550401EA	3-to-8-Line Decoder/DeMUX, Inverter, Dual Brand	3779
C	CD54HCT139/3A		Dual 1 of 4 Decoder/MUX	-
C	CD54HCT14/3A	5962-8689001CA	Hex Inverting Schmitt Trigger, Dual Brand	3760
C	CD54HCT151/3A	5962-9065201MEA	8-Input MUX, Dual Brand	-

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C	CD54HCT153/3A	5962-9050501MEA	Dual 4-Input MUX, Dual Brand	-
C	CD54HCT154/3A	5962-8670101JA	4-to-16-Line Decoder/DeMUX, Dual Brand	3784
C	CD54HCT157/3A	5962-9070201MEA	Quad 2-Input MUX, Dual Brand	3785
C	CD54HCT161/3A	5962-8685401EA	Synchronous 4-Bit Binary Counter, Dual Brand	3788
C	CD54HCT163/3A		Synchronous 4-Bit Binary Counter, Synchronous Reset	3790
C	CD54HCT164/3A	5962-8970401CA	8-Bit Serial-In/Parallel-Out Shift Register, Dual Brand	3791
C	CD54HCT165/3A	5962-8685501EA	8-Bit Parallel-In/Serial-Out Shift Register, Dual Brand	3792
C	CD54HCT166/3A		8-Bit Parallel-In/Serial-Out Shift Register	3793
C	CD54HCT173/3A	5962-8875901EA	Quad D-Type Flip-Flop, Three-State, Dual Brand	3794
C	CD54HCT174/3A	5962-8974301EA	Hex D-Type Flip-Flop, Three-State, Dual Brand	-
C	CD54HCT175/3A	5962-8970101EA	Quad D-Type Flip-Flop with Reset, Dual Brand	-
C	CD54HCT191/3A	5962-8867101EA	Synchronous 4-Bit Binary Up/Down Counter, Dual Brand	3798
C	CD54HCT193/3A	5962-9084801MEA	Synchronous 4-Bit Binary Up/Down Counter, Dual Brand	3800
C	CD54HCT20/3A		Dual 4-Input NAND Gate	-
C	CD54HCT238/3A	5962-8974501EA	3-to-8-Line Decoder/DeMUX, Dual Brand	3805
C	CD54HCT240/3A	8550501RA	Octal Buffer Line Driver, Three-State, Inverter, Dual Brand	3806
C	CD54HCT241/3A		Octal Buffer Line Driver, Three-State	3807
C	CD54HCT243/3A		Quad Bus Transceiver, Three-State	3808
C	CD54HCT244/3A	8513001RA	Octal Buffer Line Driver, Three-State, Dual Brand	3809
C	CD54HCT245/3A	8550601RA	Octal Buffer Transceiver, Three-State, Dual Brand	3810
C	CD54HCT251/3A	5962-9052401MEA	8-Input MUX, Three-State, Dual Brand	3811
C	CD54HCT257/3A	5962-8970501EA	Quad 2-Input MUX, Three-State, Dual Brand	3813
C	CD54HCT258/3A	5962-8970801EA	Quad 2-Line-to-4-Line Data Selector, Dual Brand	3814
C	CD54HCT259/3A	5962-8985201EA	8-Bit Addressable Latch, Dual Brand	3815
C	CD54HCT273/3A	5962-8772501RA	8-Input NAND, Dual Brand	3816
C	CD54HCT27/3A	5962-8970301CA	Triple 3-Input NOR Gate, Dual Brand	3763
C	CD54HCT280/3A		8-Bit Odd/Even Parity Generator Checker	3817
C	CD54HCT283/3A		4-Bit Full Adder with Fast Carry	3818
C	CD54HCT299/3A	5962-8943601MRA	8-Bit Universal Shift Register, Three-State, Dual Brand	3820
C	CD54HCT30/3A	5962-8974601MRA	8-Input NAND, Dual Brand	3764
C	CD54HCT32/3A	5962-8685201CA	Quad 2-Input OR Gate, Dual Brand	3765
C	CD54HCT365/3A		Hex Buffer/Line Driver, Three-State	3823
C	CD54HCT367/3A	5962-9070601MEA	Hex Buffer/Line Drive, Three-State, Dual Brand	3825
C	CD54HCT373/3A	5962-8686701RA	Octal Transparent Latch, Three-State, Dual Brand	3827
C	CD54HCT374/3A	8550701RA	Octal D-Type Flip-Flop, Three-State, Dual Brand	3828
C	CD54HCT377/3A	5962-8976901RA	Octal D-Type Flip-Flop with Data Enable, Dual Brand	3829
C	CD54HCT390/3A	5962-9098401MEA	Dual Decade Ripple Counter, Dual Brand	3830
C	CD54HCT393/3A	5962-8989001CA	Dual 4-Bit Binary Ripple Counter, Dual Brand	3831
C	CD54HCT40105/3A		4-Bit By 16 Word FIFO Register	3874
C	CD54HCT4017/3A	5962-9059701MEA	14-Stage Binary Ripple Counter, Dual Brand	3848
C	CD54HCT4020/3A	5962-8945801EA	12-Bit Binary Ripple Counter, Dual Brand	3849
C	CD54HCT4024/3A		7-Stage Binary Ripple Counter	3850
C	CD54HCT4040/3A	5962-8994701MEA	12-Bit Binary Ripple Counter, Dual Brand	3851
C	CD54HCT4046A/3A	5962-8875701EA	Phased Locked-Loop with VCO, Dual Brand	3852
C	CD54HCT4051/3A	5962-9065401MEA	8-Channel Analog MUX/DeMUX, Dual Brand	3855
C	CD54HCT4053/3A		Triple 2-Channel Analog MUX/DeMUX	3857
C	CD54HCT4059/3A	5962-8862401JA	Programmable Divided-by-N Counter, Dual Brand	-
C	CD54HCT4060/3A	5962-8977101EA	14-Stage Binary Ripple Counter with Oscillator, Dual Brand	3859

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C	CD54HCT4075/3A		Triple 3-Input OR Gate	3861
C	CD54HCT423/3A		Dual Retriggerable Monostable Multivibrator with Reset	3832
C	CD54HCT4520/3A		Dual 4-Bit Synchronous Binary Counter	3869
C	CD54HCT4538/3A		Dual Precision Monostable Multivibrator	3870
C	CD54HCT533/3A		Octal Transparent Latch, Three-State	3833
C	CD54HCT534/3A	5962-8984901RA	Octal D Flip-Flop Three-State, Inverter, Dual Brand	3834
C	CD54HCT541/3A		Octal Buffer/Line Driver, Three-State	3836
C	CD54HCT564/3A		Octal D Flip-Flop Three-State, Inverter	3838
C	CD54HCT573/3A	5962-8685601RA	Octal Transparent Latch, Three-State, Dual Brand	3839
C	CD54HCT574/3A	5962-8974201RA	Octal D-Type Flip-Flop, Three-State, Dual Brand	3840
C	CD54HCT640/3A	5962-8974001RA	Octal Bus Transceiver, Three-State, Inverter, Dual Brand	3842
C	CD54HCT646/3A		Octal Bus Transceiver	3843
C	CD54HCT688/3A	5962-8685701RA	8-Bit Magnitude Comparator, Dual Brand	3845
C	CD54HCT74/3A	5962-8685301CA	Dual 3 Flip-Flop with Set and Reset, Dual Brand	3768
C	CD54HCT75/3A	5962-9075801MEA	Quad Bistable Transparent Latch, Dual Brand	3769
C	CD54HCT85/3A	5962-8867201EA	4-Bit Magnitude Comparator, Dual Brand	3770
C	CD54HCT86/3A	5962-8984401CA	Quad 2-Input Exclusive OR Gate, Dual Brand	3771
C	CD54HCU04/3A	8601001CA	Hex Inverter, Unbuffered, Dual Brand	3875
N	CDP1802ACD3		MPU - 40 Lead SBDIP	1441
N	CDP1802AD3		MPU - 40 Lead SBDIP	1441
N	CDP1821CD3		RAM - 16 Lead CDIP 5.0V 255ns 1024 x 1	2983
N	CDP1822CD3		RAM - 22 Lead CDIP 5.0V 500ns 256 x 4	2981
N	CDP1823CD3		RAM - 24 Lead CDIP 5.0V 505ns 128 x 8	2982
N	CDP1824CD3		RAM - 18 Lead CDIP 5.0V 825ns 32 x 8	1717
N	CDP1824D3		RAM - 18 Lead CDIP 10.0V 375ns 32 x 8	1717
N	CDP1852CD3		I/O Port	1694
N	CDP1852D3		I/O Port	1694
N	CDP1853CD3		I/O Decoder	1713
N	CDP1854ACD3		I/O UART	1715
N	CDP1854AD3		I/O UART	1715
N	CMM5104D3		Rad Hard SRAM 4096 Word x 1-Bit	3406
N	CMM5104J3		Rad Hard SRAM 4096 Word x 1-Bit	3406
N	CMM5104K3		Rad Hard SRAM 4096 Word x 1-Bit	3406
N	CMM5114AD3		Rad Hard SRAM 1024 Word x 4-Bit	2081
C	DG181AA/883B		Analog Switch Channel 10 Pin Can 15V Dual SPST JFET	3114
C	DG181AL/883B		Analog Switch Channel 14 Lead Flatpack 15V Dual SPST JFET	3114
C	DG181AP/883B		Analog Switch Channel 14 Lead CDIP 15V Dual SPST JFET	3114
C	DG182AA/883B		Analog Switch Channel 10 Pin Can 15V Dual SPST JFET	3114
C	DG182AP/883B		Analog Switch Channel 14 Lead CDIP 15V Dual SPST JFET	3114
C	DG184AL/883B		Analog Switch Channel 14 Lead Flatpack 15V Dual DPST JFET	3114
C	DG184AP/883B		Analog Switch Channel 16 Lead CDIP 15V Dual DPST JFET	3114
C	DG185AP/883B		Analog Switch Channel 16 Lead CDIP 15V Dual DPST JFET	3114
C	DG187AA/883B		Analog Switch Channel 10 Pin Can 15V SPDT JFET	3114
C	DG187AL/883B		Analog Switch Channel 14 Lead Flatpack 15V SPDT JFET	3114
C	DG187AP/883B		Analog Switch Channel 14 Lead CDIP 15V SPDT JFET	3114
C	DG188AA/883B		Analog Switch Channel 10 Pin Can 15V SPDT JFET	3114
C	DG188AP/883B		Analog Switch Channel 14 Lead CDIP 15V SPDT JFET	3114

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	DG190AL/883B		Analog Switch Channel 14 Lead Flatpack 15V Dual SPDT JFET	3114
C	DG190AP/883B		Analog Switch Channel 16 Lead CDIP 15V Dual SPDT JFET	3114
C	DG191AL/883B		Analog Switch Channel 14 Lead Flatpack 15V Dual SPDT JFET	3114
C	DG191AP/883B		Analog Switch Channel 16 Lead CDIP 15V Dual SPDT JFET	3114
C	DG200AA/883B		Analog Switch Channel 10 Pin Can 15V Dual SPST CMOS	-
C	DG200AK/883B		Analog Switch Channel 14 Lead CDIP 15V Dual SPST CMOS	3115
C	DG201AAK/883B	7705301EA	Analog Switch Channel 16 Lead CDIP 15V Quad SPST CMOS	-
	DG201AAP	JM38510/12302BEA	See Ref P/N	3117
C	DG201AK/883B		Analog Switch Channel 16 Lead CDIP 15V Quad SPST CMOS	3115
C	DG202AK/883B		Analog Switch Channel 16 Lead CDIP 15V Quad SPST CMOS	3117
C	DG300AAA/883B		Analog Switch Channel 10 Pin Can 15V Dual SPST CMOS	-
C	DG300AAK/883B		Analog Switch Channel 14 Lead CDIP 15V Dual SPST CMOS	3119
	DG300AAP	JM38510/11601BCA	See Ref P/N	3119
C	DG301AAA/883B		Analog Switch Channel 10 Pin Can 15V SPDT CMOS	-
C	DG301AAK/883B		Analog Switch Channel 14 Lead CDIP 15V SPDT CMOS	-
	DG301AAP	JM38510/11602BCA	See Ref P/N	3119
C	DG302AAK/883B		Analog Switch Channel 14 Lead CDIP 15V Dual DPST CMOS	3119
	DG302AAP	JM38510/11603BCA	See Ref P/N	3119
C	DG303AAK/883B		Analog Switch Channel 14 Lead CDIP 15V Dual SPDT CMOS	-
	DG303AAP	JM38510/11604BCA	See Ref P/N	3119
C	DG308AAK/883B		Analog Switch Channel 16 Lead CDIP 15V Quad SPST CMOS	-
C	DG309AK/883B		Analog Switch,16 Lead CDIP 15V Quad SPST CMOS	-
C	DG401AK/883	5962-9056901EA	Analog Switch, Two SPST, Dual Brand	3703
N	DG401EJ		Switch, Two SPST, Extended Processing, -40/+85, w/BI, PDIP	3284
N	DG401EY		Switch, Two SPST, Extended Processing, -40/+85, w/BI, SOIC	3284
N	DG401EY-T		Switch, Two SPST, Extended Process, -40/+85, w/BI, T&R, SOIC	3284
C	DG403AK/883	5962-8976301MEA	Analog Switch, Two SPDT, Dual Brand	3703
N	DG403EJ		Switch, Two SPDT, Extended Processing, -40/+85 w/BI, PDIP	3284
N	DG403EY		Switch, Two SPDT, Extended Processing, -40/+85 w/BI, SOIC	3284
N	DG403EY-T		Switch, Two SPDT, Extended Process, -40/+85 w/BI, T&R SOIC	3284
C	DG405AK/883	5962-8996101EA	Analog Switch, Two DPST, Dual Brand	3703
N	DG405EJ		Switch, Two DPST, Extended Processing, -40/+85 w/BI, PDIP	3284
N	DG405EY		Switch, Two DPST, Extended Processing, -40/+85 w/BI, SOIC	3284
N	DG405EY-T		Switch, Two DPST, Extended Process, -40/+85 w/BI, T&R SOIC	3284
C	DG408AK/883	5962-9204201MEA	Analog MUX, Single 8-Channel, Dual Brand	3688

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	DG408EJ		MUX, Single 8-Channel, Extended Process, -40/+85 w/BI, PDIP	3283
N	DG408EY		MUX, Single 8-Channel, Extended Process, -40/+85 w/BI, SOIC	3283
N	DG408EY-T		MUX, Single 8-Channel, Extended Process, -40/+85 w/BI, T&R SOIC	3283
C	DG409AK/883	5962-9204202MEA	Analog MUX, Differential 4-Channel, Dual Brand	3688
N	DG409EJ		MUX, Differential 4-Channel, Extended Process, -40/+85 w/BI, PDIP	3282
N	DG409EY		MUX, Differential 4-Channel, Extended Process, -40/+85 w/BI, SOIC	3282
N	DG409EY-T		MUX, Differential 4-Channel, Extended Process, -40/+85 w/BI, T&R SOIC	3282
C	DG411AK/883	5962-9073101MEA	Analog Switch, Quad SPST, Dual Brand	3681
N	DG411EJ		Switch, Quad SPST, Extended Processing, -40/+85 w/BI, PDIP	3282
N	DG411EY		Switch, Quad SPST, Extended Processing, -40/+85 w/BI, SOIC	3282
N	DG411EY-T		Switch, Quad SPST, Extended Process, -40/+85 w/BI, T&R SOIC	3282
C	DG412AK/883	5962-9073102MEA	Analog Switch, Quad SPST, Dual Brand	3681
N	DG412EJ		Switch, Quad SPST, Extended Processing, -40/+85 w/BI, PDIP	3282
N	DG412EY		Switch, Quad SPST, Extended Processing, -40/+85 w/BI, SOIC	3282
N	DG412EY-T		Switch, Quad SPST, Extended Process, -40/+85 w/BI, T&R SOIC	3282
C	DG413AK/883	5962-9073103MEA	Analog Switch, Quad SPST, Dual Brand	3681
N	DG413EJ		Switch, Quad SPST, Extended Processing, -40/+85 w/BI, PDIP	3282
N	DG413EY		Switch, Quad SPST, Extended Processing, -40/+85 w/BI, SOIC	3282
N	DG413EY-T		Switch, Quad SPST, Extended Process, -40/+85 w/BI, T&R SOIC	3282
C	DG441AK/883	5962-9204101MEA	Analog Switch, Quad SPST, Dual Brand	3687
N	DG441EJ		Switch, Quad SPST, Extended Processing, -40/+85 w/BI, PDIP	3281
N	DG441EY		Switch, Quad SPST, Extended Processing, -40/+85 w/BI, SOIC	3281
N	DG441EY-T		Switch, Quad SPST, Extended Process, -40/+85 w/BI, T&R SOIC	3281
C	DG442AK/883	5962-9204102MEA	Analog Switch, Quad SPST, Dual Brand	3687
N	DG442EJ		Switch, Quad SPST, Extended Processing -40/+85, w/BI, PDIP	3281
N	DG442EY		Switch, Quad SPST, Extended Processing, -40/+85 w/BI, SOIC	3281
N	DG442EY-T		Switch, Quad SPST, Extended Process, -40/+85 w/BI, T&R SOIC	3281
C	DG458AK/883B		MUX, 16 Lead CDIP, 15V, 8-Channel, Over-Voltage Protected	3708
C	DG459AK/883B		MUX, 16 Lead CDIP, 15V, 8-Channel, Over-Voltage Protected	3708
C	DG506AAK/883B		Analog MUX, 28 Lead CDIP, 15V, 16-Channel	3137
C	DG507AAK/883B		Analog MUX, 28 Lead CDIP, 15V Differential 8-Channel	3137
C	DG508AAK/883B		Analog MUX, 16 Lead CDIP,15V 8-Channel	3137
C	DG509AAK/883B		Analog MUX, 16 Lead CDIP,15V Differential 4-Channel	3137

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	DG526AK/883B		Analog MUX, 28 Lead CDIP,15V 16-Channel Latchable	3139
C	DG527AK/883B		Analog MUX, 28 Lead CDIP,15V Dual 8-Channel Latchable	3139
C	DG528AK/883B		Analog MUX, 18 Lead CDIP,15V 8-Channel Latchable	3139
C	DG529AK/883B		Analog MUX, 18 Lead CDIP 15V Dual 4-Channel Latchable	3139
N	FRE160D1	2N7300D	Rad Hard Power NMOS 100V, 41A, 0.050Ω 10K, TO-258AA	3258
C	FRE160D2	2N7300D	Rad Hard Power NMOS 100V, 41A, 0.050Ω 10K, TO-258AA	3258
C	FRE160D3	2N7300D	Rad Hard Power NMOS 100V, 41A, 0.050Ω 10K, TO-258AA	3258
N	FRE160H1	2N7300H	Rad Hard Power NMOS 100V, 41A, 0.050Ω 1M, TO-258AA	3258
C	FRE160H2	2N7300H	Rad Hard Power NMOS 100V, 41A, 0.050Ω 1M, TO-258AA	3258
C	FRE160H3	2N7300H	Rad Hard Power NMOS 100V, 41A, 0.050Ω 1M, TO-258AA	3258
N	FRE160H4	2N7300H	Rad Hard Power NMOS 100V, 41A, 0.050Ω 1M, TO-258AA	3258
N	FRE160R1	2N7300R	Rad Hard Power NMOS 100V, 41A, 0.050Ω 100K, TO-258AA	3258
C	FRE160R2	2N7300R	Rad Hard Power NMOS 100V, 41A, 0.050Ω 100K, TO-258AA	3258
C	FRE160R3	2N7300R	Rad Hard Power NMOS 100V, 41A, 0.050Ω 100K, TO-258AA	3258
N	FRE160R4	2N7300R	Rad Hard Power NMOS 100V, 41A, 0.050Ω 100K, TO-258AA	3258
N	FRE260D1	2N7302D	Rad Hard Power NMOS 200V, 31A, 0.080Ω 10K, TO-258AA	3259
C	FRE260D2	2N7302D	Rad Hard Power NMOS 200V, 31A, 0.080Ω 10K, TO-258AA	3259
C	FRE260D3	2N7302D	Rad Hard Power NMOS 200V, 31A, 0.080Ω 10K, TO-258AA	3259
N	FRE260H1	2N7302H	Rad Hard Power NMOS 200V, 31A, 0.080Ω 1M, TO-258AA	3259
N	FRE260H2	2N7302H	Rad Hard Power NMOS 200V, 31A, 0.080Ω 1M, TO-258AA	3259
C	FRE260H3	2N7302H	Rad Hard Power NMOS 200V, 31A, 0.080Ω 1M, TO-258AA	3259
N	FRE260H4	2N7302H	Rad Hard Power NMOS 200V, 31A, 0.080Ω 1M, TO-258AA	3259
N	FRE260R1	2N7302R	Rad Hard Power NMOS 200V, 31A, 0.080Ω 100K, TO-258AA	3259
C	FRE260R2	2N7302R	Rad Hard Power NMOS 200V, 31A, 0.080Ω 100K, TO-258AA	3259
C	FRE260R3	2N7302R	Rad Hard Power NMOS 200V, 31A, 0.080Ω 100K, TO-258AA	3259
N	FRE260R4	2N7302R	Rad Hard Power NMOS 200V, 31A, 0.080Ω 100K, TO-258AA	3259
N	FRE460D1	2N7306D	Rad Hard Power NMOS 500V, 12A, 0.410Ω 10K, TO-258AA	3261
C	FRE460D2	2N7306D	Rad Hard Power NMOS 500V, 12A, 0.410Ω 10K, TO-258AA	3261
C	FRE460D3	2N7306D	Rad Hard Power NMOS 500V, 12A, 0.410Ω 10K, TO-258AA	3261
N	FRE460H1	2N7306H	Rad Hard Power NMOS 500V, 12A, 0.410Ω 1M, TO-258AA	3261
C	FRE460H2	2N7306H	Rad Hard Power NMOS 500V, 12A, 0.410Ω 1M, TO-258AA	3261
C	FRE460H3	2N7306H	Rad Hard Power NMOS 500V, 12A, 0.410Ω 1M, TO-258AA	3261
N	FRE460H4	2N7306H	Rad Hard Power NMOS 500V, 12A, 0.410Ω 1M, TO-258AA	3261
N	FRE460R1	2N7306R	Rad Hard Power NMOS 500V, 12A, 0.410Ω 100K, TO-258AA	3261
C	FRE460R2	2N7306R	Rad Hard Power NMOS 500V, 12A, 0.410Ω 100K, TO-258AA	3261
C	FRE460R3	2N7306R	Rad Hard Power NMOS 500V, 12A, 0.410Ω 100K, TO-258AA	3261
N	FRE460R4	2N7306R	Rad Hard Power NMOS 500V, 12A, 0.410Ω 100K, TO-258AA	3261
N	FRE9160D1	2N7329D	Rad Hard Power PMOS 100V, 30A, 0.095Ω 10K, TO-258AA	3268
C	FRE9160D2	2N7329D	Rad Hard Power PMOS 100V, 30A, 0.095Ω 10K, TO-258AA	3268
C	FRE9160D3	2N7329D	Rad Hard Power PMOS 100V, 30A, 0.095Ω 10K, TO-258AA	3268
N	FRE9160H1	2N7329H	Rad Hard Power PMOS 100V, 30A, 0.095Ω 1M, TO-258AA	3268
C	FRE9160H2	2N7329H	Rad Hard Power PMOS 100V, 30A, 0.095Ω 1M, TO-258AA	3268
C	FRE9160H3	2N7329H	Rad Hard Power PMOS 100V, 30A, 0.095Ω 1M, TO-258AA	3268
N	FRE9160H4	2N7329H	Rad Hard Power PMOS 100V, 30A, 0.095Ω 1M, TO-258AA	3268
N	FRE9160R1	2N7329R	Rad Hard Power PMOS 100V, 30A, 0.095Ω 100K,TO-258AA	3268
C	FRE9160R2	2N7329R	Rad Hard Power PMOS 100V, 30A, 0.095Ω 100K, TO-258AA	3268
C	FRE9160R3	2N7329R	Rad Hard Power PMOS 100V, 30A, 0.095Ω 100K, TO-258AA	3268
N	FRE9160R4	2N7329R	Rad Hard Power PMOS 100V, 30A, 0.095Ω 100K TO-258AA	3268
N	FRF150D1	2N7292D	Rad Hard Power NMOS 100V, 25A, 0.07Ω 10K, TO-254AA	3215
C	FRF150D2	2N7292D	Rad Hard Power NMOS 100V, 25A, 0.07Ω 10K, TO-254AA	3215

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	FRF150D3	2N7292D	Rad Hard Power NMOS 100V, 25A, 0.07Ω 10K, TO-254AA	3215
N	FRF150H1	2N7292H	Rad Hard Power NMOS 95V, 25A, 005Ω 1M, TO-254AA	3215
C	FRF150H2	2N7292H	Rad Hard Power NMOS 95V, 25A, 005Ω 1M, TO-254AA	3215
C	FRF150H3	2N7292H	Rad Hard Power NMOS 95V, 25A, 005Ω 1M, TO-254AA	3215
N	FRF150H4	2N7292H	Rad Hard Power NMOS 95V, 25A, 005Ω 1M, TO-254AA	3215
N	FRF150R1	2N7292R	Rad Hard Power NMOS 100V, 25A, 0.07Ω 100K, TO-254AA	3215
C	FRF150R2	2N7292R	Rad Hard Power NMOS 100V, 25A, 0.07Ω 100K, TO-254AA	3215
C	FRF150R3	2N7292R	Rad Hard Power NMOS 100V, 25A, 0.07Ω 100K, TO-254AA	3215
N	FRF150R4	2N7292R	Rad Hard Power NMOS 100V, 25A, 0.07Ω 100K, TO-254AA	3215
N	FRF250D1	2N7294D	Rad Hard Power NMOS 200V, 23A, 015Ω 10K, TO-254AA	3227
C	FRF250D2	2N7294D	Rad Hard Power NMOS 200V, 23A, 015Ω 10K, TO-254AA	3227
C	FRF250D3	2N7294D	Rad Hard Power NMOS 200V, 23A, 015Ω 10K, TO-254AA	3227
N	FRF250H1	2N7294H	Rad Hard Power NMOS 190V, 23A, 061Ω 1M, TO-254AA	3227
C	FRF250H2	2N7294H	Rad Hard Power NMOS 190V, 23A, 061Ω 1M, TO-254AA	3227
C	FRF250H3	2N7294H	Rad Hard Power NMOS 190V, 23A, 061Ω 1M, TO-254AA	3227
N	FRF250H4	2N7294H	Rad Hard Power NMOS 190V, 23A, 061Ω 1M, TO-254AA	3227
N	FRF250R1	2N7294R	Rad Hard Power NMOS 200V, 23A, 015Ω 100K, TO-254AA	3227
C	FRF250R2	2N7294R	Rad Hard Power NMOS 200V, 23A, 015Ω 100K, TO-254AA	3227
C	FRF250R3	2N7294R	Rad Hard Power NMOS 200V, 23A, 015Ω 100K, TO-254AA	3227
N	FRF250R4	2N7294R	Rad Hard Power NMOS 200V, 23A, 015Ω 100K, TO-254AA	3227
N	FRF254D1	2N7296D	Rad Hard Power NMOS 250V, 17A, 085Ω 10K, TO-254AA	3232
C	FRF254D2	2N7296D	Rad Hard Power NMOS 250V, 17A, 085Ω 10K, TO-254AA	3232
C	FRF254D3	2N7296D	Rad Hard Power NMOS 250V, 17A, 085Ω 10K, TO-254AA	3232
N	FRF254H1	2N7296H	Rad Hard Power NMOS 238V, 17A, 034Ω 1M, TO-254AA	3232
C	FRF254H2	2N7296H	Rad Hard Power NMOS 238V, 17A, 034Ω 1M TO-254AA	3232
C	FRF254H3	2N7296H	Rad Hard Power NMOS 238V, 17A, 034Ω 1M TO-254AA	3232
N	FRF254H4	2N7296H	Rad Hard Power NMOS 238V, 17A, 034Ω 1M TO-254AA	3232
N	FRF254R1	2N7296R	Rad Hard Power NMOS 250V, 17A, 085Ω 100K TO-254AA	3232
C	FRF254R2	2N7296R	Rad Hard Power NMOS 250V, 17A, 085Ω 100K TO-254AA	3232
C	FRF254R3	2N7296R	Rad Hard Power NMOS 250V, 17A, 085Ω 100K TO-254AA	3232
N	FRF254R4	2N7296R	Rad Hard Power NMOS 250V, 17A, 085Ω 100K TO-254AA	3232
N	FRF450D1	2N7298D	Rad Hard Power NMOS 500V, 9A, 0.615Ω 10K TO-254AA	3237
C	FRF450D2	2N7298D	Rad Hard Power NMOS 500V, 9A, 0.615Ω 10K TO-254AA	3237
C	FRF450D3	2N7298D	Rad Hard Power NMOS 500V, 9A, 0.615Ω 10K TO-254AA	3237
N	FRF450H1	2N7298H	Rad Hard Power NMOS 475V, 9A, 0.879Ω 1M TO-254AA	3237
C	FRF450H2	2N7298H	Rad Hard Power NMOS 475V, 9A, 0.879Ω 1M TO-254AA	3237
C	FRF450H3	2N7298H	Rad Hard Power NMOS 475V, 9A, 0.879Ω 1M TO-254AA	3237
N	FRF450H4	2N7298H	Rad Hard Power NMOS 475V, 9A, 0.879Ω 1M TO-254AA	3237
N	FRF450R1	2N7298R	Rad Hard Power NMOS 500V, 9A, 0.615Ω 100K TO-254AA	3237
C	FRF450R2	2N7298R	Rad Hard Power NMOS 500V, 9A, 0.615Ω 100K TO-254AA	3237
C	FRF450R3	2N7298R	Rad Hard Power NMOS 500V, 9A, 0.615Ω 100K TO-254AA	3237
N	FRF450R4	2N7298R	Rad Hard Power NMOS 500V, 9A, 0.615Ω 100K TO-254AA	3237
N	FRF9150D1	2N7323D	Rad Hard Power PMOS 100V, 23A, 04Ω 10K TO-254AA	3243
C	FRF9150D2	2N7323D	Rad Hard Power PMOS 100V, 23A, 04Ω 10K TO-254AA	3243
C	FRF9150D3	2N7323D	Rad Hard Power PMOS 100V, 23A, 04Ω 10K TO-254AA	3243
N	FRF9150H1	2N7323H	Rad Hard Power PMOS 95V, 23A, 01Ω 1M TO-254AA	3243
C	FRF9150H2	2N7323H	Rad Hard Power PMOS 95V, 23A, 01Ω 1M TO-254AA	3243
C	FRF9150H3	2N7323H	Rad Hard Power PMOS 95V, 23A, 01Ω 1M TO-254AA	3243
N	FRF9150H4	2N7323H	Rad Hard Power PMOS 95V, 23A, 01Ω 1M TO-254AA	3243
N	FRF9150R1	2N7323R	Rad Hard Power PMOS 100V, 23A, 04Ω 100K TO-254AA	3243

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	FRF9150R2	2N7323R	Rad Hard Power PMOS 100V, 23A, 04Ω 100K TO-254AA	3243
C	FRF9150R3	2N7323R	Rad Hard Power PMOS 100V, 23A, 04Ω 100K TO-254AA	3243
N	FRF9150R4	2N7323R	Rad Hard Power PMOS 100V, 23A, 04Ω 100K TO-254AA	3243
N	FRF9250D1	2N7325D	Rad Hard Power PMOS 200V, 14A, 015Ω 10K TO-254AA	3247
C	FRF9250D2	2N7325D	Rad Hard Power PMOS 200V, 14A, 015Ω 10K TO-254AA	3247
C	FRF9250D3	2N7325D	Rad Hard Power PMOS 200V, 14A, 015Ω 10K TO-254AA	3247
N	FRF9250H1	2N7325H	Rad Hard Power PMOS 190V, 14A, 0.493Ω 1M TO-254AA	3247
C	FRF9250H2	2N7325H	Rad Hard Power PMOS 190V, 14A, 0.493Ω 1M TO-254AA	3247
C	FRF9250H3	2N7325H	Rad Hard Power PMOS 190V, 14A, 0.493Ω 1M TO-254AA	3247
N	FRF9250H4	2N7325H	Rad Hard Power PMOS 190V, 14A, 0.493Ω 1M TO-254AA	3247
N	FRF9250R1	2N7325R	Rad Hard Power PMOS 200V, 14A, 015Ω 100K TO-254AA	3247
C	FRF9250R2	2N7325R	Rad Hard Power PMOS 200V, 14A, 015Ω 100K TO-254AA	3247
C	FRF9250R3	2N7325R	Rad Hard Power PMOS 200V, 14A, 015Ω 100K TO-254AA	3247
N	FRF9250R4	2N7325R	Rad Hard Power PMOS 200V, 14A, 015Ω 100K TO-254AA	3247
N	FRK150D1	2N7291D	Rad Hard Power NMOS 100V, 40A, 0.055Ω 10K TO-204AE	3221
C	FRK150D2	2N7291D	Rad Hard Power NMOS 100V, 40A, 0.055Ω 10K TO-204AE	3221
C	FRK150D3	2N7291D	Rad Hard Power NMOS 100V, 40A, 0.055Ω 10K TO-204AE	3221
N	FRK150H1	2N7291H	Rad Hard Power NMOS 95V, 40A, 0.083Ω 1M TO-204AE	3221
C	FRK150H2	2N7291H	Rad Hard Power NMOS 95V, 40A, 0.083Ω 1M TO-204AE	3221
C	FRK150H3	2N7291H	Rad Hard Power NMOS 95V, 40A, 0.083Ω 1M TO-204AE	3221
N	FRK150H4	2N7291H	Rad Hard Power NMOS 95V, 40A, 0.083Ω 1M TO-204AE	3221
N	FRK150R1	2N7291R	Rad Hard Power NMOS 100V, 40A, 0.055Ω 100K TO-204AE	3221
C	FRK150R2	2N7291R	Rad Hard Power NMOS 100V, 40A, 0.055Ω 100K TO-204AE	3221
C	FRK150R3	2N7291R	Rad Hard Power NMOS 100V, 40A, 0.055Ω 100K TO-204AE	3221
N	FRK150R4	2N7291R	Rad Hard Power NMOS 100V, 40A, 0.055Ω 100K TO-204AE	3221
N	FRK160D1	2N7299D	Rad Hard Power NMOS 100V, 66A, 0.04Ω 10K TO-204AE	3222
C	FRK160D2	2N7299D	Rad Hard Power NMOS 100V, 66A, 0.04Ω 10K TO-204AE	3222
C	FRK160D3	2N7299D	Rad Hard Power NMOS 100V, 66A, 0.04Ω 10K TO-204AE	3222
N	FRK160H1	2N7299H	Rad Hard Power NMOS 95V, 66A, 0.06Ω 1M TO-204AE	3222
C	FRK160H2	2N7299H	Rad Hard Power NMOS 95V, 66A, 0.06Ω 1M TO-204AE	3222
C	FRK160H3	2N7299H	Rad Hard Power NMOS 95V, 66A, 0.06Ω 1M TO-204AE	3222
N	FRK160H4	2N7299H	Rad Hard Power NMOS 95V, 66A, 0.06Ω 1M TO-204AE	3222
N	FRK160R1	2N7299R	Rad Hard Power NMOS 100V, 66A, 0.04Ω 100K TO-204AE	3222
C	FRK160R2	2N7299R	Rad Hard Power NMOS 100V, 66A, 0.04Ω 100K TO-204AE	3222
C	FRK160R3	2N7299R	Rad Hard Power NMOS 100V, 66A, 0.04Ω 100K TO-204AE	3222
N	FRK160R4	2N7299R	Rad Hard Power NMOS 100V, 66A, 0.04Ω 100K TO-204AE	3222
N	FRK250D1	2N7293D	Rad Hard Power NMOS 200V, 27A, 00Ω 10K TO-204AE	3226
C	FRK250D2	2N7293D	Rad Hard Power NMOS 200V, 27A, 00Ω 10K TO-204AE	3226
C	FRK250D3	2N7293D	Rad Hard Power NMOS 200V, 27A, 00Ω 10K TO-204AE	3226
N	FRK250H1	2N7293H	Rad Hard Power NMOS 190V, 27A, 04Ω 1M TO-204AE	3226
C	FRK250H2	2N7293H	Rad Hard Power NMOS 190V, 27A, 04Ω 1M TO-204AE	3226
C	FRK250H3	2N7293H	Rad Hard Power NMOS 190V, 27A, 04Ω 1M TO-204AE	3226
N	FRK250H4	2N7293H	Rad Hard Power NMOS 190V, 27A, 04Ω 1M TO-204AE	3226
N	FRK250R1	2N7293R	Rad Hard Power NMOS 200V, 27A, 00Ω 100K TO-204AE	3226
C	FRK250R2	2N7293R	Rad Hard Power NMOS 200V, 27A, 00Ω 100K TO-204AE	3226
C	FRK250R3	2N7293R	Rad Hard Power NMOS 200V, 27A, 00Ω 100K TO-204AE	3226
N	FRK250R4	2N7293R	Rad Hard Power NMOS 200V, 27A, 00Ω 100K TO-204AE	3226
N	FRK254D1	2N7295D	Rad Hard Power NMOS 250V, 20A, 07Ω 10K TO-204AE	3231
C	FRK254D2	2N7295D	Rad Hard Power NMOS 250V, 20A, 07Ω 10K TO-204AE	3231
C	FRK254D3	2N7295D	Rad Hard Power NMOS 250V, 20A, 07Ω 10K TO-204AE	3231

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PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	FRK254H1	2N7295H	Rad Hard Power NMOS 238V, 20A, 015Ω 1M TO-204AE	3231
C	FRK254H2	2N7295H	Rad Hard Power NMOS 238V, 20A, 015Ω 1M TO-204AE	3231
C	FRK254H3	2N7295H	Rad Hard Power NMOS 238V, 20A, 015Ω 1M TO-204AE	3231
N	FRK254H4	2N7295H	Rad Hard Power NMOS 238V, 20A, 015Ω 1M TO-204AE	3231
N	FRK254R1	2N7295R	Rad Hard Power NMOS 250V, 20A, 07Ω 100K TO-204AE	3231
C	FRK254R2	2N7295R	Rad Hard Power NMOS 250V, 20A, 07Ω 100K TO-204AE	3231
C	FRK254R3	2N7295R	Rad Hard Power NMOS 250V, 20A, 07Ω 100K TO-204AE	3231
N	FRK254R4	2N7295R	Rad Hard Power NMOS 250V, 20A, 07Ω 100K TO-204AE	3231
N	FRK260D1	2N7301D	Rad Hard Power NMOS 200V, 46A, 0.07Ω 10K TO-204AE	3228
C	FRK260D2	2N7301D	Rad Hard Power NMOS 200V, 46A, 0.07Ω 10K TO-204AE	3228
C	FRK260D3	2N7301D	Rad Hard Power NMOS 200V, 46A, 0.07Ω 10K TO-204AE	3228
N	FRK260H1	2N7301H	Rad Hard Power NMOS 190V, 46A, 005Ω 1M TO-204AE	3228
C	FRK260H2	2N7301H	Rad Hard Power NMOS 190V, 46A, 005Ω 1M TO-204AE	3228
C	FRK260H3	2N7301H	Rad Hard Power NMOS 190V, 46A, 005Ω 1M TO-204AE	3228
N	FRK260H4	2N7301H	Rad Hard Power NMOS 190V, 46A, 005Ω 1M TO-204AE	3228
N	FRK260R1	2N7301R	Rad Hard Power NMOS 200V, 46A, 0.07Ω 100K TO-204AE	3228
C	FRK260R2	2N7301R	Rad Hard Power NMOS 200V, 46A, 0.07Ω 100K TO-204AE	3228
C	FRK260R3	2N7301R	Rad Hard Power NMOS 200V, 46A, 0.07Ω 100K TO-204AE	3228
N	FRK260R4	2N7301R	Rad Hard Power NMOS 200V, 46A, 0.07Ω 100K TO-204AE	3228
N	FRK264D1	2N7303D	Rad Hard Power NMOS 250V, 34A, 02Ω 10K TO-204AE	3233
C	FRK264D2	2N7303D	Rad Hard Power NMOS 250V, 34A, 02Ω 10K TO-204AE	3233
C	FRK264D3	2N7303D	Rad Hard Power NMOS 250V, 34A, 02Ω 10K TO-204AE	3233
N	FRK264H1	2N7303H	Rad Hard Power NMOS 238V, 34A, 08Ω 1M TO-204AE	3233
C	FRK264H2	2N7303H	Rad Hard Power NMOS 238V, 34A, 08Ω 1M TO-204AE	3233
C	FRK264H3	2N7303H	Rad Hard Power NMOS 238V, 34A, 08Ω 1M TO-204AE	3233
N	FRK264H4	2N7303H	Rad Hard Power NMOS 238V, 34A, 08Ω 1M TO-204AE	3233
N	FRK264R1	2N7303R	Rad Hard Power NMOS 250V, 34A, 02Ω 100K TO-204AE	3233
C	FRK264R2	2N7303R	Rad Hard Power NMOS 250V, 34A, 02Ω 100K TO-204AE	3233
C	FRK264R3	2N7303R	Rad Hard Power NMOS 250V, 34A, 02Ω 100K TO-204AE	3233
N	FRK264R4	2N7303R	Rad Hard Power NMOS 250V, 34A, 02Ω 100K TO-204AE	3233
N	FRK460D1	2N7305D	Rad Hard Power NMOS 500V, 17A, 0.40Ω 10K TO-204AE	3238
C	FRK460D2	2N7305D	Rad Hard Power NMOS 500V, 17A, 0.40Ω 10K TO-204AE	3238
C	FRK460D3	2N7305D	Rad Hard Power NMOS 500V, 17A, 0.40Ω 10K TO-204AE	3238
N	FRK460H1	2N7305H	Rad Hard Power NMOS 475V, 17A, 0.60Ω 1M TO-204AE	3238
C	FRK460H2	2N7305H	Rad Hard Power NMOS 475V, 17A, 0.60Ω 1M TO-204AE	3238
C	FRK460H3	2N7305H	Rad Hard Power NMOS 475V, 17A, 0.60Ω 1M TO-204AE	3238
N	FRK460H4	2N7305H	Rad Hard Power NMOS 475V, 17A, 0.60Ω 1M TO-204AE	3238
N	FRK460R1	2N7305R	Rad Hard Power NMOS 500V, 17A, 0.40Ω 100K TO-204AE	3238
C	FRK460R2	2N7305R	Rad Hard Power NMOS 500V, 17A, 0.40Ω 100K TO-204AE	3238
C	FRK460R3	2N7305R	Rad Hard Power NMOS 500V, 17A, 0.40Ω 100K TO-204AE	3238
N	FRK460R4	2N7305R	Rad Hard Power NMOS 500V, 17A, 0.40Ω 100K TO-204AE	3238
N	FRK9150D1	2N7322D	Rad Hard Power PMOS 100V, 26A, 025Ω 10K TO-204AE	3266
C	FRK9150D2	2N7322D	Rad Hard Power PMOS 100V, 26A, 025Ω 10K TO-204AE	3266
C	FRK9150D3	2N7322D	Rad Hard Power PMOS 100V, 26A, 025Ω 10K TO-204AE	3266
N	FRK9150H1	2N7322H	Rad Hard Power PMOS 95V, 26A, 08Ω 1M TO-204AE	3266
C	FRK9150H2	2N7322H	Rad Hard Power PMOS 95V, 26A, 08Ω 1M TO-204AE	3266
C	FRK9150H3	2N7322H	Rad Hard Power PMOS 95V, 26A, 08Ω 1M TO-204AE	3266
N	FRK9150H4	2N7322H	Rad Hard Power PMOS 95V, 26A, 08Ω 1M TO-204AE	3266
N	FRK9150R1	2N7322R	Rad Hard Power PMOS 100V, 26A, 025Ω 100K TO-204AE	3266
C	FRK9150R2	2N7322R	Rad Hard Power PMOS 100V, 26A, 025Ω 100K TO-204AE	3266

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	FRK9150R3	2N7322R	Rad Hard Power PMOS 100V, 26A, 025Ω 100K TO-204AE	3266
N	FRK9150R4	2N7322R	Rad Hard Power PMOS 100V, 26A, 025Ω 100K TO-204AE	3266
N	FRK9160D1	2N7328D	Rad Hard Power PMOS 100V, 40A, 0.085Ω 10K TO-204AE	3244
C	FRK9160D2	2N7328D	Rad Hard Power PMOS 100V, 40A, 0.085Ω 10K TO-204AE	3244
C	FRK9160D3	2N7328D	Rad Hard Power PMOS 100V, 40A, 0.085Ω 10K TO-204AE	3244
N	FRK9160H1	2N7328H	Rad Hard Power PMOS 95V, 40A, 028Ω 1M TO-204AE	3244
C	FRK9160H2	2N7328H	Rad Hard Power PMOS 95V, 40A, 028Ω 1M TO-204AE	3244
C	FRK9160H3	2N7328H	Rad Hard Power PMOS 95V, 40A, 028Ω 1M TO-204AE	3244
N	FRK9160H4	2N7328H	Rad Hard Power PMOS 95V, 40A, 028Ω 1M TO-204AE	3244
N	FRK9160R1	2N7328R	Rad Hard Power PMOS 100V, 40A, 0.085Ω 100K TO-204AE	3244
C	FRK9160R2	2N7328R	Rad Hard Power PMOS 100V, 40A, 0.085Ω 100K TO-204AE	3244
C	FRK9160R3	2N7328R	Rad Hard Power PMOS 100V, 40A, 0.085Ω 100K TO-204AE	3244
N	FRK9160R4	2N7328R	Rad Hard Power PMOS 100V, 40A, 0.085Ω 100K TO-204AE	3244
N	FRK9260D1	2N7330D	Rad Hard Power PMOS 200V, 26A, 00Ω 10K TO-204AE	3248
C	FRK9260D2	2N7330D	Rad Hard Power PMOS 200V, 26A, 00Ω 10K TO-204AE	3248
C	FRK9260D3	2N7330D	Rad Hard Power PMOS 200V, 26A, 00Ω 10K TO-204AE	3248
N	FRK9260H1	2N7330H	Rad Hard Power PMOS 190V, 26A, 00Ω 1M TO-204AE	3248
C	FRK9260H2	2N7330H	Rad Hard Power PMOS 190V, 26A, 00Ω 1M TO-204AE	3248
C	FRK9260H3	2N7330H	Rad Hard Power PMOS 190V, 26A, 00Ω 1M TO-204AE	3248
N	FRK9260H4	2N7330H	Rad Hard Power PMOS 190V, 26A, 00Ω 1M TO-204AE	3248
N	FRK9260R1	2N7330R	Rad Hard Power PMOS 200V, 26A, 00Ω 100K TO-204AE	3248
C	FRK9260R2	2N7330R	Rad Hard Power PMOS 200V, 26A, 00Ω 100K TO-204AE	3248
C	FRK9260R3	2N7330R	Rad Hard Power PMOS 200V, 26A, 00Ω 100K TO-204AE	3248
N	FRK9260R4	2N7330R	Rad Hard Power PMOS 200V, 26A, 00Ω 100K TO-204AE	3248
N	FRL130D1	2N7272D	Rad Hard Power NMOS 100V, 8A, 08Ω 10K TO-205AF	3218
C	FRL130D2	2N7272D	Rad Hard Power NMOS 100V, 8A, 08Ω 10K TO-205AF	3218
C	FRL130D3	2N7272D	Rad Hard Power NMOS 100V, 8A, 08Ω 10K TO-205AF	3218
N	FRL130H1	2N7272H	Rad Hard Power NMOS 95V, 8A, 07Ω 1M TO-205AF	3218
C	FRL130H2	2N7272H	Rad Hard Power NMOS 95V, 8A, 07Ω 1M TO-205AF	3218
C	FRL130H3	2N7272H	Rad Hard Power NMOS 95V, 8A, 07Ω 1M TO-205AF	3218
N	FRL130H4	2N7272H	Rad Hard Power NMOS 95V, 8A, 07Ω 1M TO-205AF	3218
N	FRL130R1	2N7272R	Rad Hard Power NMOS 100V, 8A, 08Ω 100K TO-205AF	3218
C	FRL130R2	2N7272R	Rad Hard Power NMOS 100V, 8A, 08Ω 100K TO-205AF	3218
C	FRL130R3	2N7272R	Rad Hard Power NMOS 100V, 8A, 08Ω 100K TO-205AF	3218
N	FRL130R4	2N7272R	Rad Hard Power NMOS 100V, 8A, 08Ω 100K TO-205AF	3218
N	FRL230D1	2N7275D	Rad Hard Power NMOS 200V, 5A, 00Ω 10K TO-205AF	3223
C	FRL230D2	2N7275D	Rad Hard Power NMOS 200V, 5A, 00Ω 10K TO-205AF	3223
C	FRL230D3	2N7275D	Rad Hard Power NMOS 200V, 5A, 00Ω 10K TO-205AF	3223
N	FRL230H1	2N7275H	Rad Hard Power NMOS 190V, 5A, 0.75Ω 1M TO-205AF	3223
C	FRL230H2	2N7275H	Rad Hard Power NMOS 190V, 5A, 0.75Ω 1M TO-205AF	3223
C	FRL230H3	2N7275H	Rad Hard Power NMOS 190V, 5A, 0.75Ω 1M TO-205AF	3223
N	FRL230H4	2N7275H	Rad Hard Power NMOS 190V, 5A, 0.75Ω 1M TO-205AF	3223
N	FRL230R1	2N7275R	Rad Hard Power NMOS 200V, 5A, 00Ω 100K TO-205AF	3223
C	FRL230R2	2N7275R	Rad Hard Power NMOS 200V, 5A, 00Ω 100K TO-205AF	3223
C	FRL230R3	2N7275R	Rad Hard Power NMOS 200V, 5A, 00Ω 100K TO-205AF	3223
N	FRL230R4	2N7275R	Rad Hard Power NMOS 200V, 5A, 00Ω 100K TO-205AF	3223
N	FRL234D1	2N7278D	Rad Hard Power NMOS 250V, 4A, 0.70Ω 10K TO-205AF	3229
C	FRL234D2	2N7278D	Rad Hard Power NMOS 250V, 4A, 0.70Ω 10K TO-205AF	3229
C	FRL234D3	2N7278D	Rad Hard Power NMOS 250V, 4A, 0.70Ω 10K TO-205AF	3229
N	FRL234H1	2N7278H	Rad Hard Power NMOS 238V, 4A, 1.0Ω 1M TO-205AF	3229

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	FRL234H2	2N7278H	Rad Hard Power NMOS 238V, 4A, 1.0Ω 1M TO-205AF	3229
C	FRL234H3	2N7278H	Rad Hard Power NMOS 238V, 4A, 1.0Ω 1M TO-205AF	3229
N	FRL234H4	2N7278H	Rad Hard Power NMOS 238V, 4A, 1.0Ω 1M TO-205AF	3229
N	FRL234R1	2N7278R	Rad Hard Power NMOS 250V, 4A, 0.70Ω 100K TO-205AF	3229
C	FRL234R2	2N7278R	Rad Hard Power NMOS 250V, 4A, 0.70Ω 100K TO-205AF	3229
C	FRL234R3	2N7278R	Rad Hard Power NMOS 250V, 4A, 0.70Ω 100K TO-205AF	3229
N	FRL234R4	2N7278R	Rad Hard Power NMOS 250V, 4A, 0.70Ω 100K TO-205AF	3229
N	FRL430D1	2N7281D	Rad Hard Power NMOS 500V, 2A, 20Ω 10K TO-205AF	3234
C	FRL430D2	2N7281D	Rad Hard Power NMOS 500V, 2A, 20Ω 10K TO-205AF	3234
C	FRL430D3	2N7281D	Rad Hard Power NMOS 500V, 2A, 20Ω 10K TO-205AF	3234
N	FRL430H1	2N7281H	Rad Hard Power NMOS 475V, 2A, 3.75Ω 1M TO-205AF	3234
C	FRL430H2	2N7281H	Rad Hard Power NMOS 475V, 2A, 3.75Ω 1M TO-205AF	3234
C	FRL430H3	2N7281H	Rad Hard Power NMOS 475V, 2A, 3.75Ω 1M TO-205AF	3234
N	FRL430H4	2N7281H	Rad Hard Power NMOS 475V, 2A, 3.75Ω 1M TO-205AF	3234
N	FRL430R1	2N7281R	Rad Hard Power NMOS 500V, 2A, 20Ω 100K TO-205AF	3234
C	FRL430R2	2N7281R	Rad Hard Power NMOS 500V, 2A, 20Ω 100K TO-205AF	3234
C	FRL430R3	2N7281R	Rad Hard Power NMOS 500V, 2A, 20Ω 100K TO-205AF	3234
N	FRL430R4	2N7281R	Rad Hard Power NMOS 500V, 2A, 20Ω 100K TO-205AF	3234
N	FRL9130D1	2N7308D	Rad Hard Power PMOS 100V, 5A, 05Ω 10K TO-205AF	3239
C	FRL9130D2	2N7308D	Rad Hard Power PMOS 100V, 5A, 05Ω 10K TO-205AF	3239
C	FRL9130D3	2N7308D	Rad Hard Power PMOS 100V, 5A, 05Ω 10K TO-205AF	3239
N	FRL9130H1	2N7308H	Rad Hard Power PMOS 95V, 5A, 0.83Ω 1M TO-205AF	3239
C	FRL9130H2	2N7308H	Rad Hard Power PMOS 95V, 5A, 0.83Ω 1M TO-205AF	3239
C	FRL9130H3	2N7308H	Rad Hard Power PMOS 95V, 5A, 0.83Ω 1M TO-205AF	3239
N	FRL9130H4	2N7308H	Rad Hard Power PMOS 95V, 5A, 0.83Ω 1M TO-205AF	3239
N	FRL9130R1	2N7308R	Rad Hard Power PMOS 100V, 5A, 05Ω 100K TO-205AF	3239
C	FRL9130R2	2N7308R	Rad Hard Power PMOS 100V, 5A, 05Ω 100K TO-205AF	3239
C	FRL9130R3	2N7308R	Rad Hard Power PMOS 100V, 5A, 05Ω 100K TO-205AF	3239
N	FRL9130R4	2N7308R	Rad Hard Power PMOS 100V, 5A, 05Ω 100K TO-205AF	3239
N	FRL9230D1	2N7311D	Rad Hard Power PMOS 200V, 3A, 10Ω 10K TO-205AF	3245
C	FRL9230D2	2N7311D	Rad Hard Power PMOS 200V, 3A, 10Ω 10K TO-205AF	3245
C	FRL9230D3	2N7311D	Rad Hard Power PMOS 200V, 3A, 10Ω 10K TO-205AF	3245
N	FRL9230H1	2N7311H	Rad Hard Power PMOS 190V, 3A, 1.95Ω 1M TO-205AF	3245
C	FRL9230H2	2N7311H	Rad Hard Power PMOS 190V, 3A, 1.95Ω 1M TO-205AF	3245
C	FRL9230H3	2N7311H	Rad Hard Power PMOS 190V, 3A, 1.95Ω 1M TO-205AF	3245
N	FRL9230H4	2N7311H	Rad Hard Power PMOS 190V, 3A, 1.95Ω 1M TO-205AF	3245
N	FRL9230R1	2N7311R	Rad Hard Power PMOS 200V, 3A, 10Ω 100K TO-205AF	3245
C	FRL9230R2	2N7311R	Rad Hard Power PMOS 200V, 3A, 10Ω 100K TO-205AF	3245
C	FRL9230R3	2N7311R	Rad Hard Power PMOS 200V, 3A, 10Ω 100K TO-205AF	3245
N	FRL9230R4	2N7311R	Rad Hard Power PMOS 200V, 3A, 10Ω 100K TO-205AF	3245
N	FRM130D1	2N7271D	Rad Hard Power NMOS 100V, 14A, 08Ω 10K TO-204AA	3217
C	FRM130D2	2N7271D	Rad Hard Power NMOS 100V, 14A, 08Ω 10K TO-204AA	3217
C	FRM130D3	2N7271D	Rad Hard Power NMOS 100V, 14A, 08Ω 10K TO-204AA	3217
N	FRM130H1	2N7271H	Rad Hard Power NMOS 95V, 14A, 07Ω 1M TO-204AA	3217
C	FRM130H2	2N7271H	Rad Hard Power NMOS 95V, 14A, 07Ω 1M TO-204AA	3217
C	FRM130H3	2N7271H	Rad Hard Power NMOS 95V, 14A, 07Ω 1M TO-204AA	3217
N	FRM130H4	2N7271H	Rad Hard Power NMOS 95V, 14A, 07Ω 1M TO-204AA	3217
N	FRM130R1	2N7271R	Rad Hard Power NMOS 100V, 14A, 08Ω 100K TO-204AA	3217
C	FRM130R2	2N7271R	Rad Hard Power NMOS 100V, 14A, 08Ω 100K TO-204AA	3217
C	FRM130R3	2N7271R	Rad Hard Power NMOS 100V, 14A, 08Ω 100K TO-204AA	3217

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	FRM130R4	2N7271R	Rad Hard Power NMOS 100V, 14A, 08Ω 100K TO-204AA	3217
N	FRM140D1	2N7283D	Rad Hard Power NMOS 100V, 23A, 03Ω 10K TO-204AA	3220
C	FRM140D2	2N7283D	Rad Hard Power NMOS 100V, 23A, 03Ω 10K TO-204AA	3220
C	FRM140D3	2N7283D	Rad Hard Power NMOS 100V, 23A, 03Ω 10K TO-204AA	3220
N	FRM140H1	2N7283H	Rad Hard Power NMOS 95V, 23A, 00Ω 1M TO-204AA	3220
C	FRM140H2	2N7283H	Rad Hard Power NMOS 95V, 23A, 00Ω 1M TO-204AA	3220
C	FRM140H3	2N7283H	Rad Hard Power NMOS 95V, 23A, 00Ω 1M TO-204AA	3220
N	FRM140H4	2N7283H	Rad Hard Power NMOS 95V, 23A, 00Ω 1M TO-204AA	3220
N	FRM140R1	2N7283R	Rad Hard Power NMOS 100V, 23A, 03Ω 100K TO-204AA	3220
C	FRM140R2	2N7283R	Rad Hard Power NMOS 100V, 23A, 03Ω 100K TO-204AA	3220
C	FRM140R3	2N7283R	Rad Hard Power NMOS 100V, 23A, 03Ω 100K TO-204AA	3220
N	FRM140R4	2N7283R	Rad Hard Power NMOS 100V, 23A, 03Ω 100K TO-204AA	3220
N	FRM230D1	2N7274D	Rad Hard Power NMOS 200V, 8A, 00Ω 10K TO-204AA	3249
C	FRM230D2	2N7274D	Rad Hard Power NMOS 200V, 8A, 00Ω 10K TO-204AA	3249
C	FRM230D3	2N7274D	Rad Hard Power NMOS 200V, 8A, 00Ω 10K TO-204AA	3249
N	FRM230H1	2N7274H	Rad Hard Power NMOS 190V, 8A, 0.70Ω 1M TO-204AA	3249
C	FRM230H2	2N7274H	Rad Hard Power NMOS 190V, 8A, 0.70Ω 1M TO-204AA	3249
C	FRM230H3	2N7274H	Rad Hard Power NMOS 190V, 8A, 0.70Ω 1M TO-204AA	3249
N	FRM230H4	2N7274H	Rad Hard Power NMOS 190V, 8A, 0.70Ω 1M TO-204AA	3249
N	FRM230R1	2N7274R	Rad Hard Power NMOS 200V, 8A, 00Ω 100K TO-204AA	3249
C	FRM230R2	2N7274R	Rad Hard Power NMOS 200V, 8A, 00Ω 100K TO-204AA	3249
C	FRM230R3	2N7274R	Rad Hard Power NMOS 200V, 8A, 00Ω 100K TO-204AA	3249
N	FRM230R4	2N7274R	Rad Hard Power NMOS 200V, 8A, 00Ω 100K TO-204AA	3249
N	FRM234D1	2N7277D	Rad Hard Power NMOS 250V, 7A, 0.70Ω 10K TO-204AA	3250
C	FRM234D2	2N7277D	Rad Hard Power NMOS 250V, 7A, 0.70Ω 10K TO-204AA	3250
C	FRM234D3	2N7277D	Rad Hard Power NMOS 250V, 7A, 0.70Ω 10K TO-204AA	3250
N	FRM234H1	2N7277H	Rad Hard Power NMOS 235V, 8A, 0.88Ω 1M TO-204AA	3250
C	FRM234H2	2N7277H	Rad Hard Power NMOS 235V, 8A, 0.88Ω 1M TO-204AA	3250
C	FRM234H3	2N7277H	Rad Hard Power NMOS 235V, 8A, 0.88Ω 1M TO-204AA	3250
N	FRM234H4	2N7277H	Rad Hard Power NMOS 235V, 8A, 0.88Ω 1M TO-204AA	3250
N	FRM234R1	2N7277R	Rad Hard Power NMOS 250V, 7A, 0.70Ω 100K TO-204AA	3250
C	FRM234R2	2N7277R	Rad Hard Power NMOS 250V, 7A, 0.70Ω 100K TO-204AA	3250
C	FRM234R3	2N7277R	Rad Hard Power NMOS 250V, 7A, 0.70Ω 100K TO-204AA	3250
N	FRM234R4	2N7277R	Rad Hard Power NMOS 250V, 7A, 0.70Ω 100K TO-204AA	3250
N	FRM240D1	2N7285D	Rad Hard Power NMOS 200V, 16A, 04Ω 10K TO-204AA	3225
C	FRM240D2	2N7285D	Rad Hard Power NMOS 200V, 16A, 04Ω 10K TO-204AA	3225
C	FRM240D3	2N7285D	Rad Hard Power NMOS 200V, 16A, 04Ω 10K TO-204AA	3225
N	FRM240H1	2N7285H	Rad Hard Power NMOS 190V, 16A, 06Ω 1M TO-204AA	3225
C	FRM240H2	2N7285H	Rad Hard Power NMOS 190V, 16A, 06Ω 1M TO-204AA	3225
C	FRM240H3	2N7285H	Rad Hard Power NMOS 190V, 16A, 06Ω 1M TO-204AA	3225
N	FRM240H4	2N7285H	Rad Hard Power NMOS 190V, 16A, 06Ω 1M TO-204AA	3225
N	FRM240R1	2N7285R	Rad Hard Power NMOS 200V, 16A, 04Ω 100K TO-204AA	3225
C	FRM240R2	2N7285R	Rad Hard Power NMOS 200V, 16A, 04Ω 100K TO-204AA	3225
C	FRM240R3	2N7285R	Rad Hard Power NMOS 200V, 16A, 04Ω 100K TO-204AA	3225
N	FRM240R4	2N7285R	Rad Hard Power NMOS 200V, 16A, 04Ω 100K TO-204AA	3225
N	FRM244D1	2N7287D	Rad Hard Power NMOS 250V, 12A, 0.40Ω 10K TO-204AA	3230
C	FRM244D2	2N7287D	Rad Hard Power NMOS 250V, 12A, 0.40Ω 10K TO-204AA	3230
C	FRM244D3	2N7287D	Rad Hard Power NMOS 250V, 12A, 0.40Ω 10K TO-204AA	3230
N	FRM244H1	2N7287H	Rad Hard Power NMOS 238V, 12A, 0.60Ω 1M TO-204AA	3230
C	FRM244H2	2N7287H	Rad Hard Power NMOS 238V, 12A, 0.60Ω 1M TO-204AA	3230

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PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	FRM244H3	2N7287H	Rad Hard Power NMOS 238V, 12A, 0.60Ω 1M TO-204AA	3230
N	FRM244H4	2N7287H	Rad Hard Power NMOS 238V, 12A, 0.60Ω 1M TO-204AA	3230
N	FRM244R1	2N7287R	Rad Hard Power NMOS 250V, 12A, 0.40Ω 100K TO-204AA	3230
C	FRM244R2	2N7287R	Rad Hard Power NMOS 250V, 12A, 0.40Ω 100K TO-204AA	3230
C	FRM244R3	2N7287R	Rad Hard Power NMOS 250V, 12A, 0.40Ω 100K TO-204AA	3230
N	FRM244R4	2N7287R	Rad Hard Power NMOS 250V, 12A, 0.40Ω 100K TO-204AA	3230
N	FRM430D1	2N7280D	Rad Hard Power NMOS 500V, 3A, 20Ω 10K TO-204AA	3252
C	FRM430D2	2N7280D	Rad Hard Power NMOS 500V, 3A, 20Ω 10K TO-204AA	3252
C	FRM430D3	2N7280D	Rad Hard Power NMOS 500V, 3A, 20Ω 10K TO-204AA	3252
N	FRM430H1	2N7280H	Rad Hard Power NMOS 475V, 3A, 3.75Ω 1M TO-204AA	3252
C	FRM430H2	2N7280H	Rad Hard Power NMOS 475V, 3A, 3.75Ω 1M TO-204AA	3252
C	FRM430H3	2N7280H	Rad Hard Power NMOS 475V, 3A, 3.75Ω 1M TO-204AA	3252
N	FRM430H4	2N7280H	Rad Hard Power NMOS 475V, 3A, 3.75Ω 1M TO-204AA	3252
N	FRM430R1	2N7280R	Rad Hard Power NMOS 500V, 3A, 20Ω 100K TO-204AA	3252
C	FRM430R2	2N7280R	Rad Hard Power NMOS 500V, 3A, 20Ω 100K TO-204AA	3252
C	FRM430R3	2N7280R	Rad Hard Power NMOS 500V, 3A, 20Ω 100K TO-204AA	3252
N	FRM430R4	2N7280R	Rad Hard Power NMOS 500V, 3A, 20Ω 100K TO-204AA	3252
N	FRM440D1	2N7289D	Rad Hard Power NMOS 500V, 6A, 1.40Ω 10K TO-204AA	3235
C	FRM440D2	2N7289D	Rad Hard Power NMOS 500V, 6A, 1.40Ω 10K TO-204AA	3235
C	FRM440D3	2N7289D	Rad Hard Power NMOS 500V, 6A, 1.40Ω 10K TO-204AA	3235
N	FRM440H1	2N7289H	Rad Hard Power NMOS 475V, 6A, 20Ω 1M TO-204AA	3235
C	FRM440H2	2N7289H	Rad Hard Power NMOS 475V, 6A, 20Ω 1M TO-204AA	3235
C	FRM440H3	2N7289H	Rad Hard Power NMOS 475V, 6A, 20Ω 1M TO-204AA	3235
N	FRM440H4	2N7289H	Rad Hard Power NMOS 475V, 6A, 20Ω 1M TO-204AA	3235
N	FRM440R1	2N7289R	Rad Hard Power NMOS 500V, 6A, 1.40Ω 100K TO-204AA	3235
C	FRM440R2	2N7289R	Rad Hard Power NMOS 500V, 6A, 1.40Ω 100K TO-204AA	3235
C	FRM440R3	2N7289R	Rad Hard Power NMOS 500V, 6A, 1.40Ω 100K TO-204AA	3235
N	FRM440R4	2N7289R	Rad Hard Power NMOS 500V, 6A, 1.40Ω 100K TO-204AA	3235
N	FRM450D1	2N7297D	Rad Hard Power NMOS 500V, 10A, 0.60Ω 10K TO-204AA	3236
C	FRM450D2	2N7297D	Rad Hard Power NMOS 500V, 10A, 0.60Ω 10K TO-204AA	3236
C	FRM450D3	2N7297D	Rad Hard Power NMOS 500V, 10A, 0.60Ω 10K TO-204AA	3236
N	FRM450H1	2N7297H	Rad Hard Power NMOS 475V, 10A, 0.86Ω 1M TO-204AA	3236
C	FRM450H2	2N7297H	Rad Hard Power NMOS 475V, 10A, 0.86Ω 1M TO-204AA	3236
C	FRM450H3	2N7297H	Rad Hard Power NMOS 475V, 10A, 0.86Ω 1M TO-204AA	3236
N	FRM450H4	2N7297H	Rad Hard Power NMOS 475V, 10A, 0.86Ω 1M TO-204AA	3236
N	FRM450R1	2N7297R	Rad Hard Power NMOS 500V, 10A, 0.60Ω 100K TO-204AA	3236
C	FRM450R2	2N7297R	Rad Hard Power NMOS 500V, 10A, 0.60Ω 100K TO-204AA	3236
C	FRM450R3	2N7297R	Rad Hard Power NMOS 500V, 10A, 0.60Ω 100K TO-204AA	3236
N	FRM450R4	2N7297R	Rad Hard Power NMOS 500V, 10A, 0.60Ω 100K TO-204AA	3236
N	FRM9130D1	2N7307D	Rad Hard Power PMOS 100V, 6A, 05Ω 10K TO-204AA	3262
C	FRM9130D2	2N7307D	Rad Hard Power PMOS 100V, 6A, 05Ω 10K TO-204AA	3262
C	FRM9130D3	2N7307D	Rad Hard Power PMOS 100V, 6A, 05Ω 10K TO-204AA	3262
N	FRM9130H1	2N7307H	Rad Hard Power PMOS 95V, 6A, 0.80Ω 1M TO-204AA	3262
C	FRM9130H2	2N7307H	Rad Hard Power PMOS 95V, 6A, 0.80Ω 1M TO-204AA	3262
C	FRM9130H3	2N7307H	Rad Hard Power PMOS 95V, 6A, 0.80Ω 1M TO-204AA	3262
N	FRM9130H4	2N7307H	Rad Hard Power PMOS 95V, 6A, 0.80Ω 1M TO-204AA	3262
N	FRM9130R1	2N7307R	Rad Hard Power PMOS 100V, 6A, 05Ω 100K TO-204AA	3262
C	FRM9130R2	2N7307R	Rad Hard Power PMOS 100V, 6A, 05Ω 100K TO-204AA	3262
C	FRM9130R3	2N7307R	Rad Hard Power PMOS 100V, 6A, 05Ω 100K TO-204AA	3262
N	FRM9130R4	2N7307R	Rad Hard Power PMOS 100V, 6A, 05Ω 100K TO-204AA	3262

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	FRM9140D1	2N7316D	Rad Hard Power PMOS 100V, 11A, 00Ω 10K TO-204AA	3241
C	FRM9140D2	2N7316D	Rad Hard Power PMOS 100V, 11A, 00Ω 10K TO-204AA	3241
C	FRM9140D3	2N7316D	Rad Hard Power PMOS 100V, 11A, 00Ω 10K TO-204AA	3241
N	FRM9140H1	2N7316H	Rad Hard Power PMOS 95V, 11A, 0.45Ω 1M TO-204AA	3241
C	FRM9140H2	2N7316H	Rad Hard Power PMOS 95V, 11A, 0.45Ω 1M TO-204AA	3241
C	FRM9140H3	2N7316H	Rad Hard Power PMOS 95V, 11A, 0.45Ω 1M TO-204AA	3241
N	FRM9140H4	2N7316H	Rad Hard Power PMOS 95V, 11A, 0.45Ω 1M TO-204AA	3241
N	FRM9140R1	2N7316R	Rad Hard Power PMOS 100V, 11A, 00Ω 100K TO-204AA	3241
C	FRM9140R2	2N7316R	Rad Hard Power PMOS 100V, 11A, 00Ω 100K TO-204AA	3241
C	FRM9140R3	2N7316R	Rad Hard Power PMOS 100V, 11A, 00Ω 100K TO-204AA	3241
N	FRM9140R4	2N7316R	Rad Hard Power PMOS 100V, 11A, 00Ω 100K TO-204AA	3241
N	FRM9230D1	2N7310D	Rad Hard Power PMOS 200V, 4A, 10Ω 10K TO-204AA	3263
C	FRM9230D2	2N7310D	Rad Hard Power PMOS 200V, 4A, 10Ω 10K TO-204AA	3263
C	FRM9230D3	2N7310D	Rad Hard Power PMOS 200V, 4A, 10Ω 10K TO-204AA	3263
N	FRM9230H1	2N7310H	Rad Hard Power PMOS 190V, 4A, 1.80Ω 1M TO-204AA	3263
C	FRM9230H2	2N7310H	Rad Hard Power PMOS 190V, 4A, 1.80Ω 1M TO-204AA	3263
C	FRM9230H3	2N7310H	Rad Hard Power PMOS 190V, 4A, 1.80Ω 1M TO-204AA	3263
N	FRM9230H4	2N7310H	Rad Hard Power PMOS 190V, 4A, 1.80Ω 1M TO-204AA	3263
N	FRM9230R1	2N7310R	Rad Hard Power PMOS 200V, 4A, 10Ω 100K TO-204AA	3263
C	FRM9230R2	2N7310R	Rad Hard Power PMOS 200V, 4A, 10Ω 100K TO-204AA	3263
C	FRM9230R3	2N7310R	Rad Hard Power PMOS 200V, 4A, 10Ω 100K TO-204AA	3263
N	FRM9230R4	2N7310R	Rad Hard Power PMOS 200V, 4A, 10Ω 100K TO-204AA	3263
N	FRM9240D1	2N7318D	Rad Hard Power PMOS 200V, 7A, 0.72Ω 10K TO-204AA	3242
C	FRM9240D2	2N7318D	Rad Hard Power PMOS 200V, 7A, 0.72Ω 10K TO-204AA	3242
C	FRM9240D3	2N7318D	Rad Hard Power PMOS 200V, 7A, 0.72Ω 10K TO-204AA	3242
N	FRM9240H1	2N7318H	Rad Hard Power PMOS 190V, 7A, 1.0Ω 1M TO-204AA	3242
C	FRM9240H2	2N7318H	Rad Hard Power PMOS 190V, 7A, 1.0Ω 1M TO-204AA	3242
C	FRM9240H3	2N7318H	Rad Hard Power PMOS 190V, 7A, 1.0Ω 1M TO-204AA	3242
N	FRM9240H4	2N7318H	Rad Hard Power PMOS 190V, 7A, 1.0Ω 1M TO-204AA	3242
N	FRM9240R1	2N7318R	Rad Hard Power PMOS 200V, 7A, 0.72Ω 100K TO-204AA	3242
C	FRM9240R2	2N7318R	Rad Hard Power PMOS 200V, 7A, 0.72Ω 100K TO-204AA	3242
C	FRM9240R3	2N7318R	Rad Hard Power PMOS 200V, 7A, 0.72Ω 100K TO-204AA	3242
N	FRM9240R4	2N7318R	Rad Hard Power PMOS 200V, 7A, 0.72Ω 100K TO-204AA	3242
N	FRM9250D1	2N7324D	Rad Hard Power PMOS 200V, 17A, 00Ω 10K TO-204AA	3267
C	FRM9250D2	2N7324D	Rad Hard Power PMOS 200V, 17A, 00Ω 10K TO-204AA	3267
C	FRM9250D3	2N7324D	Rad Hard Power PMOS 200V, 17A, 00Ω 10K TO-204AA	3267
N	FRM9250H1	2N7324H	Rad Hard Power PMOS 190V, 17A, 0.42Ω 1M TO-204AA	3267
C	FRM9250H2	2N7324H	Rad Hard Power PMOS 190V, 17A, 0.42Ω 1M TO-204AA	3267
C	FRM9250H3	2N7324H	Rad Hard Power PMOS 190V, 17A, 0.42Ω 1M TO-204AA	3267
N	FRM9250H4	2N7324H	Rad Hard Power PMOS 190V, 17A, 0.42Ω 1M TO-204AA	3267
N	FRM9250R1	2N7324R	Rad Hard Power PMOS 200V, 17A, 00Ω 100K TO-204AA	3267
C	FRM9250R2	2N7324R	Rad Hard Power PMOS 200V, 17A, 00Ω 100K TO-204AA	3267
C	FRM9250R3	2N7324R	Rad Hard Power PMOS 200V, 17A, 00Ω 100K TO-204AA	3267
N	FRM9250R4	2N7324R	Rad Hard Power PMOS 200V, 17A, 00Ω 100K TO-204AA	3267
N	FRM9450D1		Rad Hard Power PMOS 500V, 8A, 1.45Ω 10K TO-204AA	-
C	FRM9450D2		Rad Hard Power PMOS 500V, 8A, 1.45Ω 10K TO-204AA	-
C	FRM9450D3		Rad Hard Power PMOS 500V, 8A, 1.45Ω 10K TO-204AA	-
N	FRS130D1	2N7273D	Rad Hard Power NMOS 100V, 12A, 095Ω 10K, TO-257AA	3219
C	FRS130D2	2N7273D	Rad Hard Power NMOS 100V, 12A, 095Ω 10K, TO-257AA	3219
C	FRS130D3	2N7273D	Rad Hard Power NMOS 100V, 12A, 095Ω 10K, TO-257AA	3219

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PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	FRS130H1	2N7273D	Rad Hard Power NMOS 95V, 12A, 093Ω 1M, TO-257AA	3219
C	FRS130H2	2N7273D	Rad Hard Power NMOS 95V, 12A, 093Ω 1M, TO-257AA	3219
C	FRS130H3	2N7273D	Rad Hard Power NMOS 95V, 12A, 093Ω 1M, TO-257AA	3219
N	FRS130H4	2N7273D	Rad Hard Power NMOS 95V, 12A, 093Ω 1M, TO-257AA	3219
N	FRS130R1	2N7273D	Rad Hard Power NMOS 100V, 12A, 095Ω 100K, TO-257AA	3219
C	FRS130R2	2N7273D	Rad Hard Power NMOS 100V, 12A, 095Ω 100K, TO-257AA	3219
C	FRS130R3	2N7273D	Rad Hard Power NMOS 100V, 12A, 095Ω 100K, TO-257AA	3219
N	FRS130R4	2N7273D	Rad Hard Power NMOS 100V, 12A, 095Ω 100K, TO-257AA	3219
N	FRS140D1	2N7284D	Rad Hard Power NMOS 100V, 23A, 045Ω 10K, TO-257AA	3254
C	FRS140D2	2N7284D	Rad Hard Power NMOS 100V, 23A, 045Ω 10K, TO-257AA	3254
C	FRS140D3	2N7284D	Rad Hard Power NMOS 100V, 23A, 045Ω 10K, TO-257AA	3254
N	FRS140H1	2N7284H	Rad Hard Power NMOS 95V, 23A, 01Ω 1M, TO-257AA	3254
C	FRS140H2	2N7284H	Rad Hard Power NMOS 95V, 23A, 01Ω 1M, TO-257AA	3254
C	FRS140H3	2N7284H	Rad Hard Power NMOS 95V, 23A, 01Ω 1M, TO-257AA	3254
N	FRS140H4	2N7284H	Rad Hard Power NMOS 95V, 23A, 01Ω 1M, TO-257AA	3254
N	FRS140R1	2N7284R	Rad Hard Power NMOS 100V, 23A, 045Ω 100K, TO-257AA	3254
C	FRS140R2	2N7284R	Rad Hard Power NMOS 100V, 23A, 045Ω 100K, TO-257AA	3254
C	FRS140R3	2N7284R	Rad Hard Power NMOS 100V, 23A, 045Ω 100K, TO-257AA	3254
N	FRS140R4	2N7284R	Rad Hard Power NMOS 100V, 23A, 045Ω 100K TO-257AA	3254
N	FRS230D1	2N7276D	Rad Hard Power NMOS 200V, 7A, 015Ω 10K, TO-257AA	3224
C	FRS230D2	2N7276D	Rad Hard Power NMOS 200V, 7A, 015Ω 10K, TO-257AA	3224
C	FRS230D3	2N7276D	Rad Hard Power NMOS 200V, 7A, 015Ω 10K, TO-257AA	3224
N	FRS230H1	2N7276H	Rad Hard Power NMOS 190V, 7A, 0.773Ω 1M, TO-257AA	3224
C	FRS230H2	2N7276H	Rad Hard Power NMOS 190V, 7A, 0.773Ω 1M, TO-257AA	3224
C	FRS230H3	2N7276H	Rad Hard Power NMOS 190V, 7A, 0.773Ω 1M, TO-257AA	3224
N	FRS230H4	2N7276H	Rad Hard Power NMOS 190V, 7A, 0.773Ω 1M, TO-257AA	3224
N	FRS230R1	2N7276R	Rad Hard Power NMOS 200V, 7A, 015Ω 100K, TO-257AA	3224
C	FRS230R2	2N7276R	Rad Hard Power NMOS 200V, 7A, 015Ω 100K, TO-257AA	3224
C	FRS230R3	2N7276R	Rad Hard Power NMOS 200V, 7A, 015Ω 100K, TO-257AA	3224
N	FRS230R4	2N7276R	Rad Hard Power NMOS 200V, 7A, 015Ω 100K, TO-257AA	3224
N	FRS234D1	2N7279D	Rad Hard Power NMOS 250V, 5A, 0.715Ω 10K, TO-257AA	3251
C	FRS234D2	2N7279D	Rad Hard Power NMOS 250V, 5A, 0.715Ω 10K, TO-257AA	3251
C	FRS234D3	2N7279D	Rad Hard Power NMOS 250V, 5A, 0.715Ω 10K, TO-257AA	3251
N	FRS234H1	2N7279H	Rad Hard Power NMOS 238V, 5A, 1.070Ω 1M, TO-257AA	3251
C	FRS234H2	2N7279H	Rad Hard Power NMOS 238V, 5A, 1.070Ω 1M, TO-257AA	3251
C	FRS234H3	2N7279H	Rad Hard Power NMOS 238V, 5A, 1.070Ω 1M, TO-257AA	3251
N	FRS234H4	2N7279H	Rad Hard Power NMOS 238V, 5A, 1.070Ω 1M, TO-257AA	3251
N	FRS234R1	2N7279R	Rad Hard Power NMOS 250V, 5A, 0.715Ω 100K, TO-257AA	3251
C	FRS234R2	2N7279R	Rad Hard Power NMOS 250V, 5A, 0.715Ω 100K, TO-257AA	3251
C	FRS234R3	2N7279R	Rad Hard Power NMOS 250V, 5A, 0.715Ω 100K TO-257AA	3251
N	FRS234R4	2N7279R	Rad Hard Power NMOS 250V, 5A, 0.715Ω 100K, TO-257AA	3251
N	FRS240D1	2N7286D	Rad Hard Power NMOS 200V, 12A, 055Ω 10K, TO-257AA	3255
C	FRS240D2	2N7286D	Rad Hard Power NMOS 200V, 12A, 055Ω 10K TO-257AA	3255
C	FRS240D3	2N7286D	Rad Hard Power NMOS 200V, 12A, 055Ω 10K, TO-257AA	3255
N	FRS240H1	2N7286H	Rad Hard Power NMOS 190V, 12A, 06Ω 1M, TO-257AA	3255
C	FRS240H2	2N7286H	Rad Hard Power NMOS 190V, 12A, 06Ω 1M, TO-257AA	3255
C	FRS240H3	2N7286H	Rad Hard Power NMOS 190V, 12A, 06Ω 1M, TO-257AA	3255
N	FRS240H4	2N7286H	Rad Hard Power NMOS 190V, 12A, 06Ω 1M TO-257AA	3255
N	FRS240R1	2N7286R	Rad Hard Power NMOS 200V, 12A, 055Ω 100K, TO-257AA	3255
C	FRS240R2	2N7286R	Rad Hard Power NMOS 200V, 12A, 055Ω 100K, TO-257AA	3255

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	FRS240R3	2N7286R	Rad Hard Power NMOS 200V, 12A, 055Ω 100K, TO-257AA	3255
N	FRS240R4	2N7286R	Rad Hard Power NMOS 200V, 12A, 055Ω 100K, TO-257AA	3255
N	FRS244D1	2N7288D	Rad Hard Power NMOS 250V, 9A, 0.415Ω 10K,TO-257AA	3256
C	FRS244D2	2N7288D	Rad Hard Power NMOS 250V, 9A, 0.415Ω 10K, TO-257AA	3256
C	FRS244D3	2N7288D	Rad Hard Power NMOS 250V, 9A, 0.415Ω 10K, TO-257AA	3256
N	FRS244H1	2N7288H	Rad Hard Power NMOS 238V, 9A, 02Ω 1 TO-257AA	3256
C	FRS244H2	2N7288H	Rad Hard Power NMOS 238V, 9A, 02Ω 1 TO-257AA	3256
C	FRS244H3	2N7288H	Rad Hard Power NMOS 238V, 9A, 02Ω 1 TO-257AA	3256
N	FRS244H4	2N7288H	Rad Hard Power NMOS 238V, 9A, 02Ω 1 TO-257AA	3256
N	FRS244R1	2N7288R	Rad Hard Power NMOS 250V, 9A, 0.415Ω 100K, TO-257AA	3256
C	FRS244R2	2N7288R	Rad Hard Power NMOS 250V, 9A, 0.415Ω 100K, TO-257AA	3256
C	FRS244R3	2N7288R	Rad Hard Power NMOS 250V, 9A, 0.415Ω 100K, TO-257AA	3256
N	FRS244R4	2N7288R	Rad Hard Power NMOS 250V, 9A, 0.415Ω 100K, TO-257AA	3256
N	FRS430D1	2N7282D	Rad Hard Power NMOS 500V, 3A, 22Ω 10K, TO-257AA	3253
C	FRS430D2	2N7282D	Rad Hard Power NMOS 500V, 3A, 22Ω 10K, TO-257AA	3253
C	FRS430D3	2N7282D	Rad Hard Power NMOS 500V, 3A, 22Ω 10K TO-257AA	3253
N	FRS430H1	2N7282H	Rad Hard Power NMOS 475V, 3A, 3.78Ω 1M, TO-257AA	3253
C	FRS430H2	2N7282H	Rad Hard Power NMOS 475V, 3A, 3.78Ω 1M, TO-257AA	3253
C	FRS430H3	2N7282H	Rad Hard Power NMOS 475V, 3A, 3.78Ω 1M TO-257AA	3253
N	FRS430H4	2N7282H	Rad Hard Power NMOS 475V, 3A, 3.78Ω 1M, TO-257AA	3253
N	FRS430R1	2N7282R	Rad Hard Power NMOS 500V, 3A, 22Ω 100K, TO-257AA	3253
C	FRS430R2	2N7282R	Rad Hard Power NMOS 500V, 3A, 22Ω 100K, TO-257AA	3253
C	FRS430R3	2N7282R	Rad Hard Power NMOS 500V, 3A, 22Ω 100K, TO-257AA	3253
C	FRS430R4	2N7282R	Rad Hard Power NMOS 500V, 3A, 22Ω 100K, TO-257AA	3253
N	FRS440D1	2N7290D	Rad Hard Power NMOS 500V, 5A, 1.42Ω 10K, TO-257AA	3257
C	FRS440D2	2N7290D	Rad Hard Power NMOS 500V, 5A, 1.42Ω 10K, TO-257AA	3257
C	FRS440D3	2N7290D	Rad Hard Power NMOS 500V, 5A, 1.42Ω 10K, TO-257AA	3257
N	FRS440H1	2N7290H	Rad Hard Power NMOS 475V, 5A, 22Ω 1M, TO-257AA	3257
C	FRS440H2	2N7290H	Rad Hard Power NMOS 475V, 5A, 22Ω 1M, TO-257AA	3257
C	FRS440H3	2N7290H	Rad Hard Power NMOS 475V, 5A, 22Ω 1M, TO-257AA	3257
N	FRS440H4	2N7290H	Rad Hard Power NMOS 475V, 5A, 22Ω 1M, TO-257AA	3257
N	FRS440R1	2N7290R	Rad Hard Power NMOS 500V, 5A, 1.42Ω 100K, TO-257AA	3257
C	FRS440R2	2N7290R	Rad Hard Power NMOS 500V, 5A, 1.42Ω 100K, TO-257AA	3257
C	FRS440R3	2N7290R	Rad Hard Power NMOS 500V, 5A, 1.42Ω 100K, TO-257AA	3257
N	FRS440R4	2N7290R	Rad Hard Power NMOS 500V, 5A, 1.42Ω 100K, TO-257AA	3257
N	FRS9130D1	2N7309D	Rad Hard Power PMOS 100V, 6A, 065Ω 10K, TO-257AA	3240
C	FRS9130D2	2N7309D	Rad Hard Power PMOS 100V, 6A, 065Ω 10K, TO-257AA	3240
C	FRS9130D3	2N7309D	Rad Hard Power PMOS 100V, 6A, 065Ω 10K, TO-257AA	3240
N	FRS9130H1	2N7309H	Rad Hard Power PMOS 95V, 6A, 0.848Ω 1M, TO-257AA	3240
C	FRS9130H2	2N7309H	Rad Hard Power PMOS 95V, 6A, 0.848Ω 1M, TO-257AA	3240
C	FRS9130H3	2N7309H	Rad Hard Power PMOS 95V, 6A, 0.848Ω 1M, TO-257AA	3240
N	FRS9130H4	2N7309H	Rad Hard Power PMOS 95V, 6A, 0.848Ω 1M, TO-257AA	3240
N	FRS9130R1	2N7309R	Rad Hard Power PMOS 100V, 6A, 065Ω 100K, TO-257AA	3240
C	FRS9130R2	2N7309R	Rad Hard Power PMOS 100V, 6A, 065Ω 100K, TO-257AA	3240
C	FRS9130R3	2N7309R	Rad Hard Power PMOS 100V, 6A, 065Ω 100K, TO-257AA	3240
N	FRS9130R4	2N7309R	Rad Hard Power PMOS 100V, 6A, 065Ω 100K, TO-257AA	3240
N	FRS9140D1	2N7317D	Rad Hard Power PMOS 100V, 11A, 015Ω 10K, TO-257AA	3264
C	FRS9140D2	2N7317D	Rad Hard Power PMOS 100V, 11A, 015Ω 10K, TO-257AA	3264
C	FRS9140D3	2N7317D	Rad Hard Power PMOS 100V, 11A, 015Ω 10K, TO-257AA	3264
N	FRS9140H1	2N7317H	Rad Hard Power PMOS 95V, 11A, 0.46Ω 1M, TO-257AA	3264

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	FRS9140H2	2N7317H	Rad Hard Power PMOS 95V, 11A, 0.46Ω 1M, TO-257AA	3264
C	FRS9140H3	2N7317H	Rad Hard Power PMOS 95V, 11A, 0.46Ω 1M, TO-257AA	3264
N	FRS9140H4	2N7317H	Rad Hard Power PMOS 95V, 11A, 0.46Ω 1M, TO-257AA	3264
N	FRS9140R1	2N7317R	Rad Hard Power PMOS 100V, 11A, 015Ω 100K, TO-257AA	3264
C	FRS9140R2	2N7317R	Rad Hard Power PMOS 100V, 11A, 015Ω 100K, TO-257AA	3264
C	FRS9140R3	2N7317R	Rad Hard Power PMOS 100V, 11A, 015Ω 100K,TO-257AA	3264
N	FRS9140R4	2N7317R	Rad Hard Power PMOS 100V, 11A, 015Ω 100K, TO-257AA	3264
N	FRS9230D1	2N7312D	Rad Hard Power PMOS 200V, 4A, 12Ω 10K, TO-257AA	3246
C	FRS9230D2	2N7312D	Rad Hard Power PMOS 200V, 4A, 12Ω, TO-257AA	3246
C	FRS9230D3	2N7312D	Rad Hard Power PMOS 200V, 4A, 12Ω 10K, TO-257AA	3246
N	FRS9230H1	2N7312H	Rad Hard Power PMOS 190V, 4A, 1.98Ω 1M, TO-257AA	3246
C	FRS9230H2	2N7312H	Rad Hard Power PMOS 190V, 4A, 1.98Ω 1M, TO-257AA	3246
C	FRS9230H3	2N7312H	Rad Hard Power PMOS 190V, 4A, 1.98Ω 1M, TO-257AA	3246
N	FRS9230H4	2N7312H	Rad Hard Power PMOS 190V, 4A, 1.98Ω 1M TO-257AA	3246
N	FRS9230R1	2N7312R	Rad Hard Power PMOS 200V, 4A, 12Ω 100K, TO-257AA	3246
C	FRS9230R2	2N7312R	Rad Hard Power PMOS 200V, 4A, 12Ω 100K, TO-257AA	3246
C	FRS9230R3	2N7312R	Rad Hard Power PMOS 200V, 4A, 12Ω 100K, TO-257AA	3246
N	FRS9230R4	2N7312R	Rad Hard Power PMOS 200V, 4A, 12Ω 100K, TO-257AA	3246
N	FRS9240D1	2N7319D	Rad Hard Power PMOS 200V, 7A, 0.735Ω 10K, TO-257AA	3265
C	FRS9240D2	2N7319D	Rad Hard Power PMOS 200V, 7A, 0.735Ω 10K, TO-257AA	3265
C	FRS9240D3	2N7319D	Rad Hard Power PMOS 200V, 7A, 0.735Ω 10K, TO-257AA	3265
N	FRS9240H1	2N7319H	Rad Hard Power PMOS 190V, 7A, 1.02Ω 1M,TO-257AA	3265
C	FRS9240H2	2N7319H	Rad Hard Power PMOS 190V, 7A, 1.02Ω 1M, TO-257AA	3265
C	FRS9240H3	2N7319H	Rad Hard Power PMOS 190V, 7A, 1.02Ω 1M, TO-257AA	3265
N	FRS9240H4	2N7319H	Rad Hard Power PMOS 190V, 7A, 1.02Ω 1M, TO-257AA	3265
N	FRS9240R1	2N7319R	Rad Hard Power PMOS 200V, 7A, 0.735Ω 100K, TO-257AA	3265
C	FRS9240R2	2N7319R	Rad Hard Power PMOS 200V, 7A, 0.735Ω 100K, TO-257AA	3265
C	FRS9240R3	2N7319R	Rad Hard Power PMOS 200V, 7A, 0.735Ω 100K, TO-257AA	3265
N	FRS9240R4	2N7319R	Rad Hard Power PMOS 200V, 7A, 0.735Ω 100K, TO-257AA	3265
N	FSF150D1		SEGR Rad Hard Power MOSFET, N-Channel, TO-254	3971
C	FSF150R3		SEGR Rad Hard Power MOSFET, N-Channel, TO-254	3971
N	FSF150R4		SEGR Rad Hard Power MOSFET, N-Channel, TO-254	3971
N	FSF254D1		SEGR Rad Hard Power MOSFET, N-Channel, TO-254	3972
C	FSF254R3		SEGR Rad Hard Power MOSFET, N-Channel, TO-254	3972
N	FSF450D1		SEGR Rad Hard Power MOSFET, N-Channel, TO-254	3970
C	FSF450R3		SEGR Rad Hard Power MOSFET, N-Channel, TO-254	3970
N	FSF450R4		SEGR Rad Hard Power MOSFET, N-Channel, TO-254	3970
N	HA1-2400-8	5962-8778301EA	Programmable Op Amp 4-Channel, 16 Lead CDIP	-
C	HA1-2400/883	5962-8778301EA	Programmable Op Amp 4-Channel, 16 Lead CDIP	3926
N	HA1-2420-8	8001601CA	Fast Sample/Hold Amplifier, 14 Lead CDIP	-
C	HA1-2420/883	8001601CA	Fast Sample/Hold Amplifier, 14 Lead CDIP	-
C	HA1-2444/883	5962-9309501MEA	Selectable, 4-Channel Video Op Amp	3608
N	HA1-2539-8	5962-8778701CA	High Slew Rate Op Amp (600V/ms), 14 Lead CDIP	-
C	HA1-2539/883	5962-8778701CA	High Slew Rate Op Amp (600V/ms), 14 Lead CDIP	3927
N	HA1-2540-8	5962-8964801CA	High Slew Rate Fast Setting Op Amp (400V/µs)	-
C	HA1-2540/883	5962-8964801CA	High Slew Rate Fast Setting Op Amp (400V/µs)	-
N	HA1-2541-8	5962-8778501CA	High Slew Rate Unity Gain Stable Op Amp	-
N	HA1-2542-8		High Slew Rate High Output Current Op Amp	-
C	HA1-2546/883	5962-9325101MEA	Wideband, Two Quadrant Analog Multiplier	2444
C	HA1-2556/883		Wideband 4-Quadrant Voltage Output Analog MUX	3619

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	HA1-2557/883		Wideband 4-Quadrant Current Output Analog MUX	3638
N	HA1-2700-8		General Purpose Op Amp	-
C	HA1-2839/883		High Slew Rate Op Amp (600V/µs), 14 Lead CDIP	3593
C	HA1-2840/883	5962-9467901CA	High Slew Rate Fast Settling (400V/µs)	3594
C	HA1-2841/883	5962-8778503CA	Wideband, Fast Settling, Unity Gain Stable	3621
C	HA1-2842/883		Wideband High Output Current Video Op Amp	3622
C	HA1-2850/883		High Slew Rate Fast Settling (340V/µs)	3595
C	HA1-4741/883		Quad General Purpose Op Amp	3704
N	HA1-4900-8		Precision Quad Comparator, 16 Lead CDIP	-
N	HA1-4902-8	5962-8686001EA	Precision Quad Comparator, 16 Lead CDIP	-
C	HA1-4902/883	5962-8686001EA	Precision Quad Comparator, 16 Lead CDIP	3929
C	HA1-5004/883		Current Feedback Amplifier, 14 Lead CDIP	3706
C	HA1-5104/883	5962-8850201CA	Quad Low Noise Op Amp, 14 Lead CDIP	3710
C	HA1-5114/883	5962-8963401CA	Quad Low Noise Op Amp, 14 Lead CDIP	3712
C	HA1-5134/883	5962-9455301MCA	Precision Quad Op Amp, 14 Lead CDIP	3713
C	HA1-5144/883	5962-8965603CA	Quad Ultra Low Power Op Amp	3934
N	HA1-5190-8	5962-88778401CA	Fast Settling Op Amp, 14 Lead CDIP	-
C	HA1-5190/883	5962-88778401CA	Fast Settling Op Amp, 14 Lead CDIP	-
N	HA1-5320-8	5962-9306302MCA	High Speed Precision Sample/Hold, 14 Lead CDIP	-
C	HA1-5320/883	5962-9306302MCA	High Speed Precision Sample/Hold, 14 Lead CDIP	2927
C	HA1-5330/883	5962-8767701CA	High Speed Sample/Hold Amplifier, 14 Lead CDIP	3935
C	HA1-5340/883	5962-9306301MCA	High Speed Low Distortion Sample/Hold	2452
	HA2-2500	JM38510/12204BGA	Ref Only	2890
N	HA2-2500-8	HA2-2500/883	Withdraw Date 9/30/95; See Ref P/N.	-
C	HA2-2500/883		Precision High Slew Rate Op Amp 30V/µs	3734
N	HA2-2502-8	HA2-2502/883	Precision High Slew Rate Op Amp 8/(TO-99)	-
C	HA2-2502/883		Precision High Slew Rate Op Amp 8/(TO-99)	3734
	HA2-2510	JM38510/12205BGA	Ref Only	2893
N	HA2-2510-8	HA2-2510/883	High Slew Rate Op Amp (60V/µs) 8/(TO-99)	-
C	HA2-2510/883		High Slew Rate Op Amp (60V/µs) 8/(TO-99)	3697
N	HA2-2512-8	HA2-2512/883	High Slew Rate Op Amp (60V/µs) 8/(TO-99)	-
C	HA2-2512/883		High Slew Rate Op Amp (60V/µs) 8/(TO-99)	3697
	HA2-2520	JM38510/12206BGA	Ref Only	2894
N	HA2-2520-8	5962-8988001G	High Slew Rate Op Amp (120V/µs) 8/(TO-99)	-
C	HA2-2520/883	5962-8988002G	High Slew Rate Op Amp (120V/µs) 8/(TO-99)	3735
N	HA2-2522-8	5962-8988001G	Uncompensated High Slew Rate Op Amp, 120V	-
C	HA2-2522/883	5962-8988001G	Uncompensated High Slew Rate Op Amp, 120V	3735
C	HA2-2529/883	5962-8972101G	Uncompensated High Slew Rate Op Amp, 160V	-
N	HA2-2541-8	5962-8778501XA	Withdraw Date 9/30/95; See Ref P/N.	-
C	HA2-2541/883	5962-8778501XA	Wideband Unity Gain Stable Op Amp, 280V/ms	3698
C	HA2-2542/883	5962-8964301XA	Wideband High Output Current Op Amp 12/(TO-99)	3928
C	HA2-2544/883	5962-8950201G	Video Operational Amp 8/(TO-99)Can	3699
C	HA2-2548/883		Precision High Speed Op Amp 8 (TO-99)Can	2472
	HA2-2600	JM38510/12202BGA	Ref Only	2902
N	HA2-2600-8	HA2-2600/883	High Slew Rate Op Amp (30V/µs), 8 Pin	-
C	HA2-2600/883		High Slew Rate Op Amp (30V/µs), 8 Pin	3700
N	HA2-2602-8	HA2-2602/883	High Slew Rate Op Amp (30V/µs), 8 Pin	-
C	HA2-2602/883		High Slew Rate Op Amp (30V/µs), 8 Pin	3700
	HA2-2620	JM38510/12203BGA	Ref Only	2903
N	HA2-2620-8	HA2-2620/883	Wideband Uncompensated Amp, 8/(TO-99) Can	-

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	HA2-2620/883		Wideband Uncompensated Amp, 8/(TO-99) Can	3701
N	HA2-2622-8	HA2-2622/883	Wideband Uncompensated Amp, 8/(TO-99) Can	-
C	HA2-2622/883		Wideband Uncompensated Amp, 8/(TO-99) Can	3701
C	HA2-2640/883	7800302G	High Voltage Op Amp (±40V/µs)	3702
N	HA2-2700-8		General Purpose Op Amp	-
N	HA2-5002-8	5962-8963601G	Wideband High Slew Rate Buffer 8/(TO-99)	-
C	HA2-5002/883	5962-8963601G	Wideband High Slew Rate Buffer 8/(TO-99)	3705
N	HA2-5033-8	5962-8963301X	Video Buffer 12/(TO-8)Can	-
C	HA2-5033/883	5962-8963301X	Video Buffer 12/(TO-8)Can	3930
C	HA2-5101/883	5962-8963501G	Single Low Noise High Performance Op Amp	3931
C	HA2-5102/883	5962-8954801G	Dual Low Noise High Performance Op Amp	3709
C	HA2-5111	5962-8963101G	Single Low Noise High Performance 8/(TO-8)	3932
C	HA2-5112/883	5962-8963201G	Dual Low Noise High Performance Op Amp	3711
C	HA2-5127/883	5962-8962701G	Precision Op Amp (OP27)	3751
N	HA2-5130-8		Precision Op Amp	-
C	HA2-5135/883		Precision Op Amp	3731
C	HA2-5137/883	5962-8962702G	Low Noise Precision Op Amp 8/(TO-99) Can	3714
C	HA2-5142/883	5962-8965602G	Dual Ultra Low Power Op Amp	3732
C	HA2-5147/883	5962-8962703G	Withdraw Date 9/30/95; See Ref P/N	3715
N	HA2-5160-8		Wideband JFET Input Op Amp, 8/(TO-99) Can	-
C	HA2-5177/883		Precision Op Amp	3733
N	HA2-5190-8	5962-8778401X	Wideband Fast Settling Op Amp, 12/(TO-8)	-
C	HA2-5190/883	5962-8778401X	Wideband Fast Settling Op Amp, 12/(TO-8)	-
C	HA2-5221/883		Withdraw Date 9/30/95.	3716
C	HA4-2400/883	5962-87783012A	Programmable Op Amp 4-Channel Dig, 20 Lead LCC	3926
C	HA4-2420/883	80016012A	Fast Sample/Hold Amplifier, 20 Lead LCC	-
C	HA4-2522/883	5962-89880012A	High Slew Rate Op Amp (120V/µs), 20 Lead LCC	3735
	HA4-2529	5962-89721012A	Ref Only	2895
C	HA4-2539/883	5962-87787012A	High Slew Rate Op Amp (600V/µs), 20 Lead LCC	3927
C	HA4-2540/883	5962-89648012A	High Slew Rate Op Amp (400V/µs), 20 Lead LCC	-
C	HA4-2544/883	5962-89502012A	High Slew Rate Op Amp (160V/µs), 20 Lead LCC	3699
C	HA4-2546/883	5962-9325101M2A	High Speed Analog Multiplier, 20 Lead LCC	2444
C	HA4-2640/883	78003022A	High Voltage Op Amp	3702
C	HA4-4741/883		Quad General Purpose Op Amp	3704
C	HA4-4902/883	5962-86860012A	Quad Comparator, 20 Lead LCC	3929
C	HA4-5002/883	5962-89636012A	High Slew Rate Buffer, 20 Lead LCC	3705
C	HA4-5020/883	5962-89620012A	Current Feedback Op Amp, 20 Lead LCC	3541
C	HA4-5101/883	5962-89635012A	Low Noise Op Amp, 20 Lead LCC	3931
C	HA4-5102/883	5962-89548012A	Dual Low Noise Op Amp, 20 Lead LCC	3709
C	HA4-5104/883	5962-88502012A	Quad Low Noise Op Amp, 20 Lead LCC	3710
C	HA4-5111/883	5962-89631012A	Low Noise Op Amp, 20 Lead LCC	3932
C	HA4-5112/883	5962-89632012A	Dual Low Noise Op Amp, 20 Lead LCC	3711
C	HA4-5114/883	5962-89634012A	Quad Low Noise Op Amp, 20 Lead LCC	3712
C	HA4-5127/883	5962-89627012A	Precision Op Amp (OP27)	3751
C	HA4-5134/883	5962-9455301M2A	Quad Precision Op Amp	3713
C	HA4-5135/883		Precision Op Amp	3731
C	HA4-5137/883	5962-89627002A	Precision Op Amp (OP37), 20 Lead LCC	3714
C	HA4-5142/883	5962-89656022A	Dual Ultra Low Power Op Amp	3732
C	HA4-5144/883	5962-89656032A	Quad Ultra Low Power Op Amp	3934
C	HA4-5147/883	5962-89627032A	Precision Op Amp (OP47), 20 Lead LCC	3715

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C	HA4-5177/883		Precision Op Amp	3733
C	HA4-5190/883	5962-87784012A	Fast Settling Op Amp, 20 Lead LCC	-
C	HA4-5221/883	5962-9163401M2A	High Performance Wideband Op Amp, 20 Lead LCC	3716
C	HA4-5222/883	5962-9163402M2A	Withdraw Date 9/30/95; See Ref P/N.	3717
N	HA4-5320-8	5962-9306302M2A	High Speed Sample/Hold Amplifier, 20 Lead LCC	-
C	HA4-5320/883	5962-9306302M2A	High Speed Sample/Hold Amplifier	2927
C	HA4-5330/883	5962-87677012A	500ns Sample/Hold Amp, 20 Lead LCC	3935
C	HA4-5340/883	5962-9306301M2A	High Speed Sample/Hold, 20 Lead LCC	2452
C	HA5022MJ/883		Dual 100MHz Op Amp, With Disable	3729
C	HA5023MJ/883		Dual 100MHz Op Amp, 8 Lead CDIP	3730
C	HA5351MJ/883		Very High Speed Sample/Hold 8 Lead CDIP	3727
C	HA5352MJ/883		Very High Speed Dual Sample/Hold	3728
	HA7-2500	JM38510/12204BPA	Ref Only	2890
C	HA7-2500/883		Precision High Slew Rate Op Amp (30V/µs)	3734
	HA7-2510	JM38510/12205BPA	Ref Only	2893
N	HA7-2510-8	HA7-2510/883	High Slew Rate Op Amp (60V/ms) 8 Lead CDIP	-
C	HA7-2510/883		High Slew Rate Op Amp (60V/ms) 8 Lead CDIP	3697
C	HA7-2512/883	HA7-2510/883	Withdraw Date 9/30/95; See Ref Substitute P/N.	3697
	HA7-2520	JM38510/12206BPA	Ref Only	2894
N	HA7-2520-8	5962-8988002PA	Uncompensated High Slew Rate Op Amp (120V/µs)	-
C	HA7-2520/883	5962-8988002PA	Uncompensated High Slew Rate Op Amp (120V/µs)	3735
N	HA7-2522-8	5962-8988001PA	Uncompensated High Slew Rate Op Amp (120V/µs)	-
C	HA7-2522/883	5962-8988001PA	Uncompensated High Slew Rate Op Amp (120V/µs)	3735
C	HA7-2529/883	5962-8972101PA	Uncompensated High Slew Rate Op Amp (160V/µs)	-
C	HA7-2544/883	5962-8950201PA	High Slew Rate Op Amp (160V/µs), 8 Lead CDIP	3699
C	HA7-2548/883		Precision High Speed Op Amp, 8 Lead CDIP	2472
	HA7-2600	JM38510/12202BPA	Ref Only	2902
C	HA7-2600/883		Wideband High Impedance Op Amp (30V/µs)	3700
C	HA7-2602/883		Wideband High Impedance Op Amp (30V/µs)	3700
	HA7-2620	JM38510/12203BPA	Ref Only	2903
N	HA7-2620-8	HA7-2620/883	Wideband Uncompensated Op Amp (60V/µs)	-
C	HA7-2620/883		Wideband Uncompensated Op Amp (60V/µs)	3701
N	HA7-2622-8	HA7-2622/883	Wideband Uncompensated Op Amp (60V/µs)	-
C	HA7-2622/883		Wideband Uncompensated Op Amp (60V/µs)	3701
C	HA7-2640/883	7800302PA	High Voltage Op Amp (±40V/µs)	3702
C	HA7-2840/883	5962-9467901MPA	High Slew Rate Op Amp (400V/µs), 8 Lead CDIP	3594
C	HA7-2841/883	5962-8778503PA	Wideband Fast Setting Unity Gain Stable Op Amp	3621
C	HA7-2842/883	5962-9469401MPA	Wideband High Output Current Video Op Amp	3622
C	HA7-2850/883		Wideband Op Amp, 8 Lead CDIP	3595
N	HA7-5002-8	5962-8963601PA	High Slew Rate Buffer, 8 Lead CDIP	-
C	HA7-5002/883	5962-8963601PA	High Slew Rate Buffer, 8 Lead CDIP	3705
C	HA7-5020/883	5962-8962001PA	100MHz Current Feedback Amp, 8 Lead CDIP	3541
C	HA7-5101/883	5962-8963501PA	Single Low Noise High Performance Op Amp	3931
C	HA7-5102/883	5962-8954801PA	Dual Low Noise High Performance Op Amp	3709
C	HA7-5111/883	5962-8963101PA	Withdraw Date 9/30/95; See Ref P/N.	3932
C	HA7-5112/883	5962-8963201PA	Dual Low Noise High Performance Op Amp	3711
C	HA7-5127/883	5962-8962701PA	Precision Op Amp (OP27)	3751
C	HA7-5135/883		Precision Op Amp	3731
C	HA7-5137/883	5962-8962702PA	Low Noise Precision Op Amp, 8 Lead CDIP	3714
C	HA7-5142/883	5962-8965602PA	Dual Ultra Low Power Op Amp	3732

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	HA7-5147/883	5962-8962703PA	Ultra Low Noise Wideband Amp, 8 Lead CDIP	3715
N	HA7-5170-8		Low Bias JFET Input Op Amp	-
C	HA7-5177/883		Precision Op Amp	3733
C	HA7-5221/883	5962-9163401MPA	High Performance Wideband Op Amp, 8 Lead CDIP	3716
C	HA7-5222/883	5962-9163402MPA	Dual Wide Band Operational Amp, 8 Lead CDIP	3717
N	HCS00DMSR		Rad Hard Quad 2-Input NAND Gate	2138
N	HCS00KMSR		Rad Hard Quad 2-Input NAND Gate	2138
N	HCS02DMSR		Rad Hard Quad 2-Input NOR Gate	2433
N	HCS02KMSR		Rad Hard Quad 2-Input NOR Gate	2433
N	HCS04DMSR		Rad Hard Hex Inverter	3046
N	HCS04KMSR		Rad Hard Hex Inverter	3046
N	HCS05DMSR		Rad Hard Hex Inverter, Open Drain Outputs	3557
N	HCS05KMSR		Rad Hard Hex Inverter, Open Drain Outputs	3557
N	HCS08DMSR		Rad Hard Quad 2-Input AND Gate	3047
N	HCS08KMSR		Rad Hard Quad 2-Input AND Gate	3047
N	HCS109DMSR		Rad Hard Dual J-K Flip-Flop	2466
N	HCS109KMSR		Rad Hard Dual J-K Flip-Flop	2466
N	HCS10DMSR		Rad Hard Triple 3-Input NAND Gate	2435
N	HCS10KMSR		Rad Hard Triple 3-Input NAND Gate	2435
N	HCS112DMSR		Rad Hard Dual J-K Flip-Flop With Set and Reset	3558
N	HCS112KMSR		Rad Hard Dual J-K Flip-Flop With Set and Reset	3558
N	HCS11DMSR		Rad Hard Triple 3-Input AND Gate	3048
N	HCS11KMSR		Rad Hard Triple 3-Input AND Gate	3048
N	HCS125DMSR		Rad Hard Quad Buffer, Three-State	3559
N	HCS125KMSR		Rad Hard Quad Buffer, Three-State	3559
N	HCS132DMSR		Rad Hard Quad 2-Input NAND Schmitt Trigger	3061
N	HCS132KMSR		Rad Hard Quad 2-Input NAND Schmitt Trigger	3061
N	HCS138DMSR		Rad Hard Inverting 3-to-8-Line Decoder/DeMUX	3560
N	HCS138KMSR		Rad Hard Inverting 3-to-8-Line Decoder/DeMUX	3560
N	HCS139DMSR		Rad Hard Dual 2-to-4-Line Decoder/DeMUX	3560
N	HCS139KMSR		Rad Hard Dual 2-to-4-Line Decoder/DeMUX	3560
N	HCS14DMSR		Rad Hard Hex Inverting Schmitt Trigger	3049
N	HCS14KMSR		Rad Hard Hex Inverting Schmitt Trigger	3049
N	HCS151DMSR		Rad Hard 8-Input MUX	3077
N	HCS151KMSR		Rad Hard 8-Input MUX	3077
N	HCS154DMSR		Rad Hard 4-to-16-Line Decoder/DeMUX	2479
N	HCS154KMSR		Rad Hard 4-to-16-Line Decoder/DeMUX	2479
N	HCS157DMSR		Rad Hard Quad 2-Input MUX	3561
N	HCS157KMSR		Rad Hard Quad 2-Input MUX	3561
N	HCS160DMSR		Rad Hard Sync. BCD Decade Counter, Async. Channel Reset	2296
N	HCS160KMSR		Rad Hard Sync. BCD Decade Counter, Async. Channel Reset	2296
N	HCS161DMSR		Rad Hard Synchronous 4-Bit Binary Counter	2469
N	HCS161KMSR		Rad Hard Synchronous 4-Bit Binary Counter	2469
N	HCS163DMSR		Rad Hard Synchronous 4-Bit Binary Counter, Synchronous Reset	3087
N	HCS163KMSR		Rad Hard Synchronous 4-Bit Binary Counter, Synchronous Reset	3087
N	HCS164DMSR		Rad Hard 8-Bit Serial-In/Parallel-Out Shift Register	2465
N	HCS164KMSR		Rad Hard 8-Bit Serial-In/Parallel-Out Shift Register	2465
N	HCS165DMSR		Rad Hard 8-Bit Parallel-In/Serial-Out Shift Register	2481

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	HCS165KMSR		Rad Hard 8-Bit Parallel-In/Serial-Out Shift Register	2481
N	HCS166DMSR		Rad Hard 8-Bit Parallel-In/Serial-Out Shift Register	2482
N	HCS166KMSR		Rad Hard 8-Bit Parallel-In/Serial-Out Shift Register	2482
N	HCS190DMSR		Rad Hard Synchronous 4-Bit Up/Down BCD Counter	2251
N	HCS190KMSR		Rad Hard Synchronous 4-Bit Up/Down BCD Counter	2251
N	HCS193DMSR		Rad Hard Synchronous 4-Bit Up/Down BCD Counter	3065
N	HCS193KMSR		Rad Hard Synchronous 4-Bit Up/Down BCD Counter	3065
N	HCS195DMSR		Rad Hard 4-Bit Parallel Access Shift Register	3385
N	HCS195KMSR		Rad Hard 4-Bit Parallel Access Shift Register	3385
N	HCS20DMSR		Rad Hard Dual 4-Input NAND Gate	3050
N	HCS20KMSR		Rad Hard Dual 4-Input NAND Gate	3050
N	HCS21DMSR		Rad Hard Dual 4-Input AND Gate	3052
N	HCS21KMSR		Rad Hard Dual 4-Input AND Gate	3052
N	HCS240DMSR		Rad Hard Octal Buffer/Line Driver, Three-State, Inverting	3562
N	HCS240KMSR		Rad Hard Octal Buffer/Line Driver, Three-State, Inverting	3562
N	HCS241DMSR		Rad Hard Octal Buffer/Line Driver, Three-State	3122
N	HCS241KMSR		Rad Hard Octal Buffer/Line Driver, Three-State	3122
N	HCS244DMSR		Rad Hard Octal Buffer/Line Driver	2132
N	HCS244KMSR		Rad Hard Octal Buffer/Line Driver	2132
N	HCS245DMSR		Rad Hard Octal Bus Transceiver, Three-State	2468
N	HCS245KMSR		Rad Hard Octal Bus Transceiver, Three-State	2468
N	HCS253DMSR		Rad Hard Dual 4-Input MUX, Three-State	3068
N	HCS253KMSR		Rad Hard Dual 4-Input MUX, Three-State	3068
N	HCS273DMSR		Rad Hard Octal D-Type Flip-Flop With Reset	2475
N	HCS273KMSR		Rad Hard Octal D-Type Flip-Flop With Reset	2475
N	HCS27DMSR		Rad Hard Triple 3-Input NOR Gate	3054
N	HCS27KMSR		Rad Hard Triple 3-Input NOR Gate	3054
N	HCS283DMSR		Rad Hard 4-Bit Full Adder	-
N	HCS283KMSR		Rad Hard 4-Bit Full Adder	-
N	HCS32DMSR		Rad Hard Quad 2-Input OR Gate	3057
N	HCS32KMSR		Rad Hard Quad 2-Input OR Gate	3057
N	HCS373DMSR		Rad Hard Transparent Latch, Three-State	2135
N	HCS373KMSR		Rad Hard Transparent Latch, Three-State	2135
N	HCS374DMSR		Rad Hard Octal D-Type Flip-Flop, Positive Edge Trigger	2470
N	HCS374KMSR		Rad Hard Octal D-Type Flip-Flop, Positive Edge Trigger	2470
N	HCS541DMSR		Rad Hard Octal Buffer/Line Driver, Three-State	-
N	HCS541KMSR		Rad Hard Octal Buffer/Line Driver, Three-State	-
N	HCS573DMSR		Rad Hard Octal Transparent Latch, Three-State	2135
N	HCS573KMSR		Rad Hard Octal Transparent Latch, Three-State	2135
N	HCS74DMSR		Rad Hard Dual-D Flip-Flop With Set and Reset, Positive Edge Trigger	2142
N	HCS74KMSR		Rad Hard Dual-D Flip-Flop With Set and Reset, Positive Edge Trigger	2142
N	HCS86DMSR		Rad Hard Quad 2-Input Exclusive OR Gate	3058
N	HCS86KMSR		Rad Hard Quad 2-Input Exclusive OR Gate	3058
N	HCTS00DMSR		Rad Hard Quad 2-Input NAND Gate	2139
N	HCTS00KMSR		Rad Hard Quad 2-Input NAND Gate	2139
N	HCTS02DMSR		Rad Hard Quad 2-Input NOR Gate	2137
N	HCTS02KMSR		Rad Hard Quad 2-Input NOR Gate	2137
N	HCTS04DMSR		Rad Hard Hex Inverter	2140

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PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	HCTS04KMSR		Rad Hard Hex Inverter	2140
N	HCTS08DMSR		Rad Hard Quad 2-Input AND Gate	2136
N	HCTS08KMSR		Rad Hard Quad 2-Input AND Gate	2136
N	HCTS109DMSR		Rad Hard J-K Flip-Flop With Set and Reset	2141
N	HCTS109KMSR		Rad Hard J-K Flip-Flop With Set and Reset	2141
N	HCTS10DMSR		Rad Hard Triple 3-Input NAND Gate	2434
N	HCTS10KMSR		Rad Hard Triple 3-Input NAND Gate	2434
N	HCTS112DMSR		Rad Hard Dual J-K Flip-Flop With Set and Reset	2467
N	HCTS112KMSR		Rad Hard Dual J-K Flip-Flop With Set and Reset	2467
N	HCTS11DMSR		Rad Hard Triple 3-Input AND Gate	2409
N	HCTS11KMSR		Rad Hard Triple 3-Input AND Gate	2409
N	HCTS132DMSR		Rad Hard Quad 2-Input NAND Schmitt Trigger	3062
N	HCTS132KMSR		Rad Hard Quad 2-Input NAND Schmitt Trigger	3062
N	HCTS138DMSR		Rad Hard Inverting 3-to-8-Line Decoder/DeMUX	2462
N	HCTS138KMSR		Rad Hard Inverting 3-to-8-Line Decoder/DeMUX	2462
N	HCTS139DMSR		Rad Hard Dual 2-to-4-Line Decoder/DeMUX	2231
N	HCTS139KMSR		Rad Hard Dual 2-to-4-Line Decoder/DeMUX	2231
N	HCTS147DMSR		Rad Hard 10-to-4 Line Priority Encoder	3063
N	HCTS147KMSR		Rad Hard 10-to-4 Line Priority Encoder	3063
N	HCTS14DMSR		Rad Hard Hex Inverter Schmitt Trigger	3205
N	HCTS14KMSR		Rad Hard Hex Inverter Schmitt Trigger	3205
N	HCTS153DMSR		Rad Hard Dual 4-Input MUX	2463
N	HCTS153KMSR		Rad Hard Dual 4-Input MUX	2463
N	HCTS157DMSR		Rad Hard Quad 2-Input MUX	2464
N	HCTS157KMSR		Rad Hard Quad 2-Input MUX	2464
N	HCTS160DMSR		Rad Hard Synchronous BCD Decade Counter	2484
N	HCTS160KMSR		Rad Hard Synchronous BCD Decade Counter	2484
N	HCTS161ADMSR		Rad Hard Synchronous 4-Bit Binary Counter	2144
N	HCTS161AKMSR		Rad Hard Synchronous 4-Bit Binary Counter	2144
N	HCTS163DMSR		Rad Hard Synchronous 4-Bit Binary Counter, Synchronous Reset	2480
N	HCTS163KMSR		Rad Hard Synchronous 4-Bit Binary Counter, Synchronous Reset	2480
N	HCTS164DMSR		Rad Hard 8-Bit Serial-In/Parallel-Out Shift Register	3386
N	HCTS164KMSR		Rad Hard 8-Bit Serial-In/Parallel-Out Shift Register	3386
N	HCTS190DMSR		Rad Hard Synchronous 4-Bit Up/Down BCD Counter	2474
N	HCTS190KMSR		Rad Hard Synchronous 4-Bit Up/Down BCD Counter	2474
N	HCTS191DMSR		Rad Hard Synchronous 4-Bit Binary Up/Down Counter	2250
N	HCTS191KMSR		Rad Hard Synchronous 4-Bit Binary Up/Down Counter	2250
N	HCTS193DMSR		Rad Hard Synchronous 4-Bit Binary Up/Down Counter	3066
N	HCTS193KMSR		Rad Hard Synchronous 4-Bit Binary Up/Down Counter	3066
N	HCTS20DMSR		Rad Hard Dual 4-Input NAND Gate	3051
N	HCTS20KMSR		Rad Hard Dual 4-Input NAND Gate	3051
N	HCTS21DMSR		Rad Hard Dual 4-Input AND Gate	3053
N	HCTS21KMSR		Rad Hard Dual 4-Input AND Gate	3053
N	HCTS240ADMSR		Rad Hard Octal Buffer/Line Driver, Three-State, Inverting	2105
N	HCTS240AKMSR		Rad Hard Octal Buffer/Line Driver, Three-State, Inverting	2105
N	HCTS244DMSR		Rad Hard Octal Buffer/Line Driver, Three-State	2133
N	HCTS244KMSR		Rad Hard Octal Buffer/Line Driver, Three-State	2133
N	HCTS245DMSR		Rad Hard Octal Bus Transceiver, Three-State	2360

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	HCTS245KMSR		Rad Hard Octal Bus Transceiver, Three-State	2360
N	HCTS273DMSR		Rad Hard Octal D Flip-Flop with Reset	2274
N	HCTS273KMSR		Rad Hard Octal D Flip-Flop with Reset	2274
N	HCTS27DMSR		Rad Hard Triple 3-Input NOR Gate	3055
N	HCTS27KMSR		Rad Hard Triple 3-Input NOR Gate	3055
N	HCTS283DMSR		Rad Hard 4-Bit Full Adder With Fast Carry	3381
N	HCTS283KMSR		Rad Hard 4-Bit Full Adder With Fast Carry	3381
N	HCTS299DMSR		Rad Hard 8-Bit Universal Shift Register, Three-State	3069
N	HCTS299KMSR		Rad Hard 8-Bit Universal Shift Register, Three-State	3069
N	HCTS30DMSR		Rad Hard 8-Input NAND Gate	3056
N	HCTS30KMSR		Rad Hard 8-Input NAND Gate	3056
N	HCTS32DMSR		Rad Hard Quad 2-Input OR Gate	2248
N	HCTS32KMSR		Rad Hard Quad 2-Input OR Gate	2248
N	HCTS365DMSR		Rad Hard Hex Buffer/Line Driver, Three-State	3070
N	HCTS365KMSR		Rad Hard Hex Buffer/Line Driver, Three-State	3070
N	HCTS373DMSR		Rad Hard Octal Transparent Latch, Three-State	2131
N	HCTS373KMSR		Rad Hard Octal Transparent Latch, Three-State	2131
N	HCTS374DMSR		Rad Hard Octal D-Type Flip-Flop, Positive Edge Trigger	2134
N	HCTS374KMSR		Rad Hard Octal D-Type Flip-Flop, Positive Edge Trigger	2134
N	HCTS390DMSR		Rad Hard Dual Decade Ripple Counter	2476
N	HCTS390KMSR		Rad Hard Dual Decade Ripple Counter	2476
N	HCTS393DMSR		Rad Hard Dual 4-State Binary Counter	3071
N	HCTS393KMSR		Rad Hard Dual 4-State Binary Counter	3071
N	HCTS4002DMSR		Rad Hard Dual 4-Input NOR Gate	3075
N	HCTS4002KMSR		Rad Hard Dual 4-Input NOR Gate	3075
N	HCTS540DMSR		Rad Hard Octal Buffer/Line Driver, Three-State	2232
N	HCTS540KMSR		Rad Hard Octal Buffer/Line Driver, Three-State	2232
N	HCTS541DMSR		Rad Hard Octal Buffer/Line Driver, Three-State	3073
N	HCTS541KMSR		Rad Hard Octal Buffer/Line Driver, Three-State	3073
N	HCTS574DMSR		Rad Hard Octal D-Type Flip-Flop, Positive Edge Trigger	2359
N	HCTS574KMSR		Rad Hard Octal D-Type Flip-Flop, Positive Edge Trigger	2359
N	HCTS646DMSR		Rad Hard Octal Bus Transceiver/Register, Three-State	3074
N	HCTS646KMSR		Rad Hard Octal Bus Transceiver/Register, Three-State	3074
N	HCTS7266DMSR		Rad Hard Quad 2-Input Exclusive NOR Gate	3384
N	HCTS7266KMSR		Rad Hard Quad 2-Input Exclusive NOR Gate	3384
N	HCTS74DMSR		Rad Hard Dual-D Flip-Flop with Set and Reset	2143
N	HCTS74KMSR		Rad Hard Dual-D Flip-Flop with Set and Reset	2143
N	HCTS75DMSR		Rad Hard Dual 2-Bit Bistable Transparent Latchable	3189
N	HCTS75KMSR		Rad Hard Dual 2-Bit Bistable Transparent Latchable	3189
N	HCTS85DMSR		Rad Hard 4-Bit Magnitude Comparator	3059
N	HCTS85KMSR		Rad Hard 4-Bit Magnitude Comparator	3059
N	HCTS86DMSR		Rad Hard Quad 2-Input Exclusive OR Gate	2249
N	HCTS86KMSR		Rad Hard Quad 2-Input Exclusive OR Gate	2249
N	HCTS93DMSR		Rad Hard 4-Bit Binary Ripple Counter	3060
N	HCTS93KMSR		Rad Hard 4-Bit Binary Ripple Counter	3060
N	HD1-15530-8	7802901JA	Manchester Encoder/Decoder, 24 Pin	2960
N	HD1-15531-8	5962-9054901MQA	Manchester Encoder/Decoder, 40 Lead CDIP	2960
C	HD1-15531/883	5962-9054901MQA	Manchester Encoder/Decoder, 40 Lead CDIP	2962
N	HD1-15531B-8	5962-9054902MQA	Manchester Encoder/Decoder 2m Bit, 40 Lead CDIP	2961
C	HD1-15531B/883	5962-9054902MQA	Manchester Encoder/Decoder, 40 Lead CDIP	2962

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	HD1-4702/883	5962-90518801MEA	Bit Rate Generator - 16 Lead CDIP	2955
C	HD1-6402B/883	5962-9052502MQA	UART- 40 Lead CDIP 8MHz	2953
C	HD1-6402R/883	5962-9052501MQA	UART- 40 Lead CDIP 2MHz	2953
C	HD1-6409/883	5962-9088801MRA	Manchester Encoder/Decoder - 2MHz, 20 Lead CDIP	2959
N	HD4-15530-8	78029013A	Manchester Encoder/Decoder, 28 Lead LCC	2960
C	HD4-6409/883	5962-9088801M2A	Manchester Encoder/Decoder - 2MHz, 20 Lead LCC	2959
C	HFA1100MJ/883	5962-9467601MPA	Op Amp - 850MHz, 8 Lead CDIP	3615
C	HFA1110MJ/883	5962-9468301MPA	Unity Gain Buffer, 850MHz, 8 Lead CDIP	3620
C	HFA1112MJ/883		Ultra High Speed Current Feedback Buffer	3610
C	HFA1113MJ/883	5962-9468201MPA	Clamped Output Buffer, 850MHz, Programmable Gain	3618
C	HFA1113ML/883	5962-9468201M2A	Clamped Output Buffer, 850MHz, 20 Lead CLCC	3618
C	HFA1115MJ/883		Programmable Gain Buffer With Clamps, 8 Lead CDIP	3724
C	HFA1120MJ/883	5962-9468501MPA	Ultra High Speed Current Feedback Op Amp	3617
C	HFA1130MJ/883	5962-9467701MPA	Clamped Output Op Amp, 850MHz, 8 Lead CDIP	3625
C	HFA1130ML/883	5962-9467701M2A	Clamped Op Amp, 850MHz, 20 Lead LCC	3625
C	HFA1135MJ/883		Low Power Op Amp, with Clamp, 8 Lead CDIP	3725
C	HFA1135ML/883		Low Power Op Amp, with Clamp, 20 Lead CLCC	3725
C	HFA1145MJ/883		Low Power, High Speed Op Amp, with Disable	3726
C	HFA1212MJ/883		Dual Programmable Gain Buffer, 8 Lead CDIP	3742
C	HFA1245MJ/883		Dual Low Power, High Speed Op Amp, with Disable	3743
C	HFA1412MJ/883		Quad Programmable Gain Buffer, 14 Lead CDIP	3744
C	HI1-0200/883		Switch, 14 Lead CDIP,15V Dual SPST CMOS	-
N	HI1-0201-8	7705302EA	Switch, 16 Lead CDIP,15V Quad SPST CMOS	-
C	HI1-0201/883	7705302EA	Switch, 16 Lead CDIP,15V Quad SPST CMOS	-
N	HI1-0201HS-8	5962-8671601EA	Switch, 16 Lead CDIP,15V Quad SPST High Speed	-
C	HI1-0201HS/883	5962-8671601EA	Switch, 16 Lead CDIP,15V Quad SPST High Speed	-
C	HI1-0222/883	5962-9456201MCA	Switch, 14 Lead CDIP,15V 200MHz Dual SPST	-
C	HI1-0301/883		Switch, 14 Lead CDIP,15V SPDT CMOS Analog	-
C	HI1-0302/883		Switch, 14 Lead CDIP,15V Dual DPST CMOS Analog	-
C	HI1-0306/883		Switch, 14 Lead CDIP,15V Dual DPST CMOS Analog	-
C	HI1-0307/883		Switch, 14 Lead CDIP,15V Dual SPDT CMOS Analog	-
C	HI1-0384/883		Switch, 16 Lead CDIP,15V Dual DPST CMOS Analog	-
C	HI1-0390/883		Switch, 16 Lead CDIP,15V Dual SPDT CMOS Analog	-
	HI1-0506	JM38510/19001BXA	See Ref P/N	3142
N	HI1-0506-8	5962-8513107XA	MUX, 28 Lead CDIP,15V 16-Channel CMOS Analog	3142
C	HI1-0506/883	5962-8513107XA	MUX, 28 Lead CDIP,15V 16-Channel CMOS Analog	-
N	HI1-0506A-8	HI1-0546/883	MUX, 28 Lead CDIP,15V 16-Channel Over-Voltage Protected Analog	3143
	HI1-0507	JM38510/19003BXA	See Ref P/N	3142
N	HI1-0507-8	5962-8513108XA	MUX, 28 Lead CDIP,15V Differential 8-Channel CMOS	3143
C	HI1-0507/883	5962-8513108XA	MUX, 28 Lead CDIP,15V Differential 8-Channel CMOS	-
N	HI1-0507A-8	HI1-0547/883	MUX, 28 Lead CDIP,15V Differential Over-Voltage Protected Analog	3143
	HI1-0508	JM38510/19007BEA	See Ref P/N	3142
N	HI1-0508-8	7705201E	MUX, 16 Lead CDIP,15V 8-Channel CMOS Analog	3142
C	HI1-0508/883	7705201E	MUX, 16 Lead CDIP,15V 8-Channel CMOS Analog	-
N	HI1-0508A-8	HI1-0548/883	MUX, 16 Lead CDIP.15V 8-Channel Over-Voltage Protected Analog	3143
	HI1-0509	JM38510/19008BEA	See Ref P/N	3142
N	HI1-0509-8	5962-8513109EA	MUX, 16 Lead CDIP,15V Differential 4-Channel CMOS	3142

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	HI1-0509/883	5962-8513109EA	MUX, 16 Lead CDIP,15V Differential 4-Channel CMOS	-
N	HI1-0509A-8	HI1-0549/883	MUX, 16 Lead CDIP,15V Differential 4-Channel, Over-Voltage Protected	3143
N	HI1-0516-8	5962-8869901XA	MUX, 28 Lead CDIP,15V 16-Channel/Differential 8-Channel	3146
C	HI1-0516/883	5962-8869901XA	MUX, 28 Lead CDIP,15V 16-Channel/Differential 8-Channel	-
N	HI1-0518-8		MUX, 18 Lead CDIP,15V 8-Channel/Differential 4-Channel	3147
N	HI1-0524-8	5962-8761801VA	MUX, 16 Lead CDIP,15V 4-Channel Wideband/Video	3148
C	HI1-0524/883	5962-8761801VA	MUX, 16 Lead CDIP,15V 4-Channel Wideband/Video	-
N	HI1-0539-8		MUX, 16 Lead CDIP,15V 4-Channel Low Level, Differential	3149
	HI1-0546	JM38510/19002BXA	See Ref P/N	3150
C	HI1-0546/883	5962-8513101XA	MUX, 28 Lead CDIP,15V 16-Channel Over-Voltage Protected	-
	HI1-0547	JM38510/19004BXA	See Ref P/N	3150
C	HI1-0547/883	5962-8513102XA	MUX, 28 Lead CDIP,15V Differential 8-Channel Over-Voltage Protected	-
	HI1-0548	JM38510/19005BEA	See Ref P/N	3150
C	HI1-0548/883	7705202EA	MUX, 16 Lead CDIP,15V 8-Channel Over-Voltage Protected	-
	HI1-0549	JM38510/19006BEA	See Ref P/N	3150
C	HI1-0549/883	5962-8513103XA	MUX, 16 Lead CDIP,15V Differential 4-Channel Over Voltage Protected	-
C	HI1-1818A/883		MUX, 16 Lead CDIP,15V 8-Channel CMOS Analog	-
C	HI1-1828A/883		MUX, 16 Lead CDIP, 15V Differential 4-Channel CMOS	-
C	HI1-5040/883	8100609EA/MLB	Switch, 16 Lead CDIP, 15V SPST CMOS Analog	-
N	HI1-5041-8	8100610EA/MLB	Switch, 16 Lead CDIP, 15V Dual SPST CMOS Analog	-
C	HI1-5041/883	8100610EA/MLB	Switch, 16 Lead CDIP, 15V Dual SPST CMOS Analog	-
C	HI1-5042/883	8100611EA/MLB	Switch, 16 Lead CDIP, 15V SPDT CMOS Analog	-
N	HI1-5043-8	8100612EA/MLB	Switch, 16 Lead CDIP, 15V Dual SPDT CMOS Analog	-
C	HI1-5043/883	8100612EA/MLB	Switch, 16 Lead CDIP, 15V Dual SPDT CMOS Analog	-
C	HI1-5044/883	8100613EA/MLB	Switch, 16 Lead CDIP, 15V DPST CMOS Analog	-
C	HI1-5045/883	8100614EA/MLB	Switch, 16 Lead CDIP, 15V Dual DPST CMOS Analog	-
C	HI1-5046/883	8100615EA/MLB	Switch, 16 Lead CDIP, 15V DPDT CMOS Analog	-
C	HI1-5046A/883	8100616EA/MLB	Switch, 16 Lead CDIP, 15V DPDT CMOS Analog	-
C	HI1-5047/883	8100617EA/MLB	Switch, 16 Lead CDIP, 15V 4PST CMOS Analog	-
C	HI1-5047A/883	8100618EA/MLB	Switch, 16 Lead CDIP, 15V 4PST CMOS Analog	-
C	HI1-5048/883	8100619EA/MLB	Switch, 16 Lead CDIP, 15V Dual SPST CMOS Analog	-
C	HI1-5049/883	8100620EA/MLB	Switch, 16 Lead CDIP, 15V Dual DPST CMOS Analog	-
C	HI1-5050/883	8100621EA/MLB	Switch, 16 Lead CDIP, 15V SPDT CMOS Analog	-
N	HI1-5051-8	8100622EA/MLB	Switch, 16 Lead CDIP, 15V Dual SPDT CMOS Analog	-
C	HI1-5051/883	8100622EA/MLB	Switch, 16 Lead CDIP 15V Dual SPDT CMOS Analog	-
C	HI1-565ASD/883		D/A Converter, 12-Bit, 20 Lead CDIP	-
C	HI1-565ATD/883		D/A Converter, 12-Bit, 20 Lead CDIP	-
C	HI1-5700S/883	5962-9467801MXA	Flash A/D, 28 Lead CDIP, 8-Bit, 20 MSPS	3286
C	HI1-5701T/883		Flash A/D, 18 Lead CDIP, 6-Bit, 30 MSPS	3378
C	HI1-574ASD/883		A/D Converter, 28 Lead SBDIP, 12-Bit	3096
C	HI1-574ATD/883	5962-8512704XA	A/D Converter, 28 Lead SBDIP, 12-Bit	3096
C	HI1-574AUD/883	5962-8512703XA	A/D Converter, 28 Lead SBDIP, 12-Bit, 1/2 LSB	3096
C	HI1-674ASD/883		A/D Converter, 28 Lead SBDIP, 12-Bit, 12ms	3096
C	HI1-674ATD/883		A/D Converter, 28 Lead SBDIP, 12-Bit,12ms	3096
C	HI1-674AUD/883		A/D Converter, 28 Lead SBDIP, 12-Bit,12ms	3096
C	HI1-774S/883		A/D Converter, 28 Lead SBDIP, 12-Bit	3096
C	HI1-774T/883		A/D Converter, 28 Lead SBDIP, 12-Bit	3096

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	HI1-774U/883		A/D Converter, 28 Lead SBDIP, 12-Bit	3096
C	HI2-0200/883		Switch, 10 Pin Can, 15V Dual SPST CMOS	-
C	HI2-0300/883		Switch, 10 Pin Can, 15V Dual SPST CMOS	-
C	HI2-0301/883		Switch, 10 Pin Can, 15V SPDT CMOS Analog	-
C	HI2-0304/883		Switch, 10 Pin Can, 15V Dual SPST CMOS	-
C	HI2-0305/883		Switch, 10 Pin Can, 15V SPST CMOS Analog	-
C	HI2-0381/883		Switch, 10 Pin Can, 15V Dual SPST CMOS	-
C	HI2-0387/883		Switch, 10 Pin Can, 15V SPDT CMOS Analog	-
C	HI4-0201/883	77053022A	Switch, 20 Lead LCC, 15V Quad SPST CMOS	-
C	HI4-0201HS/883	5962-86716012A	Switch, 20 Lead LCC, 15V Quad SPST High Speed	-
	HI4-0222	5962-9456201M2A	See Ref P/N	-
C	HI4-0506/883	5962-85131073A	MUX, 28 Lead LCC, 15V 16-Channel CMOS	-
N	HI4-0506A-8	HI4-0546/883	MUX, 28 Lead LCC, 15V 16-Channel Over-Voltage Protected	-
C	HI4-0507/883	5962-85131083A	MUX, 28 Lead LCC, 15V Differential 8-Channel CMOS	-
N	HI4-0507A-8	HI4-0547/883	MUX, 28 Lead LCC, 15V Differential 8-Channel Over-Voltage Protected	3143
C	HI4-0508/883	77052012A	MUX, 20 Lead LCC, 15V 8-Channel CMOS	-
N	HI4-0508A-8	HI4-0548/883	MUX, 20 Lead LCC, 15V 8-Channel Over-Voltage Protected	3143
C	HI4-0509/883	5962-85131092A	MUX, 20 Lead LCC, 15V Differential 4-Channel CMOS	-
N	HI4-0509A-8	HI4-0549/883	MUX, 20 Lead LCC, 15V Differential 4-Channel Over-Voltage Protected	3143
N	HI4-0516-8	5962-88699013A	MUX, 28 Lead LCC, 15V 16-Channel/Differential 8-Channel	3146
N	HI4-0518-8		MUX, 20 Lead LCC, 15V 8-Channel/Differential 4-Channel	3147
N	HI4-0524-8		MUX, 20 Lead LCC, 15V 4-Channel Wideband/Video	3148
C	HI4-0546/883	5962-85131013A	MUX, 28 Lead LCC, 15V 16-Channel Over-Voltage Protected	-
C	HI4-0547/883	5962-85131023A	MUX, 28 Lead LCC, 15V Differential 8-Channel Over-Voltage Protected	-
C	HI4-0548/883	77052022A	MUX, 20 Lead LCC 15V 8-Channel Over-Voltage Protected	-
C	HI4-0549/883	5962-85131032A	MUX, 20 Lead LCC 15V Differential 4-Channel Over-Voltage Protected	-
N	HI4-1828A-8		MUX, 20 Lead LCC 15V Differential 4-Channel	3141
C	HI4-5043/883	81006122A	Switch, 20 Lead LCC, 15V Dual SPDT CMOS	-
C	HI4-5045/883	81006142A	Switch, 20 Lead LCC, 15V Dual SPDT CMOS	-
C	HI4-5051/883	81006222A	Switch, 20 Lead LCC, 15V Dual SPDT CMOS	-
C	HI4-574ASE/883		A/D Converter, 44 Lead LCC, 12-Bit 25ms	-
C	HI4-574ATE/883	5962-8512704YA	A/D Converter, 44 Lead LCC, 12-Bit 25ms	-
C	HI4-574AUE/883	5962-8512703YA	A/D Converter, 44 Lead LCC, 12-Bit 25ms	-
C	HI4-674ASE/883		A/D Converter, 44 Lead LCC, 12-Bit 12ms	-
C	HI4-674ATE/883		A/D Converter, 44 Lead LCC, 12-Bit 12ms	-
C	HI4-674AUE/883		A/D Converter, 44 Lead LCC, 12-Bit 12ms	-
C	HI4-774S/883		A/D Converter, 44 Lead LCC, 12-Bit 8ms	-
C	HI4-774T/883		A/D Converter, 44 Lead LCC, 12-Bit 8ms	-
C	HI4-774U/883		A/D Converter, 44 Lead LCC, 12-Bit 8ms	-
C	HI5800SMF/883		A/D Converter, 12-Bit, 3 MSPS, 2 LSB, 44 Lead CQFP	2938
C	HI5800TMF/883		A/D Converter, 2-Bit, 3 MSPS, 1 LSB, 33 Lead CQFP	2938-
	HM1-6504	24501BVA	(JM38510/) See Ref P/N	2994
C	HM1-6504/883	8102405VA	4096 x 1 CMOS RAM, 300ns, 18 Lead CDIP	2993
C	HM1-6504B/883	8102403VA	4096 x 1 CMOS RAM, 200ns, 18 Lead CDIP	2993
C	HM1-6508/883		1024 x 1 CMOS RAM, 250ns, 16 Lead CDIP	2985
C	HM1-6508B/883		1024 x 4 CMOS RAM, 180ns, 16 Lead CDIP	2985

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
	HM1-6514	24502BVA	(JM38510/) See Ref P/N	2995
C	HM1-6514/883	8102406VA	1024 x 4 CMOS RAM, 300ns,18 Lead CDIP	2996
C	HM1-6514B/883	8102404VA	1024 x 1 CMOS RAM, 200ns 18 Lead CDIP	2996
C	HM1-6514S/883	8102402VA	1024 x 4 CMOS RAM, 120ns Access Time	2996
	HM1-6516	29102BJA	(JM38510/) See Ref P/N	2998
C	HM1-6516/883	8403601JA	2048 x 8 CMOS RAM, 200ns Access Time	2999
	HM1-65162	29104BJA	(JM38510/) See Ref P/N	3000
C	HM1-65162/883	8403602JA	2048 x 8 CMOS RAM, 90ns Access Time	3001
	HM1-65162B	29110BJA	(JM38510/) See Ref P/N	3000
C	HM1-65162B/883	8403606JA	2048 x 8 CMOS RAM, 70ns Access Time	3001
C	HM1-65162C/883	8403603ZA	2048 x 8 CMOS RAM, 90ns Access Time	3001
C	HM1-6516B/883	8403607JA	2048 x 8 CMOS RAM, 120ns Access Time	2999
C	HM1-6518/883		1024 x 4 CMOS RAM, 250ns, 18 Lead CDIP	2986
	HM1-65262	29103BRA	(JM38510/) See Ref P/N	3002
C	HM1-65262/883	8413201RA	6K x 1 CMOS RAM, 85ns Access Time	3003
C	HM1-6551/883		256 x 4 CMOS RAM, 300ns, 22 Lead CDIP	2988
C	HM1-6551B/883		256 x 4 CMOS RAM, 220n, 22 Lead CDIP	2988
C	HM1-6561/883		256 x 4 CMOS RAM, 300ns, 18 Lead CDIP	2990
C	HM1-6561B/883		256 x 4 CMOS RAM, 220ns, 18 Lead CDIP	2990
C	HM1-65642/883		8192 x 8 CMOS RAM, 150ns, Access Time	3004
	HM1-65642B	29205BXA	(JM38510/) See Ref P/N	-
C	HM1-65642B/883		8192 x 8 CMOS RAM, 150ns Access Time	3004
C	HM1-65642C/883		8192 x 8 CMOS RAM, 200ns Access Time	3004
C	HM1-6617/883	5962-8954001JA	2K x 8 CMOS PROM, 120ns Access Time	3016
C	HM1-6617B/883	5962-8954002JA	2K x 8 CMOS PROM, 90ns Access Time	3016
C	HM1-6642/883	5962-8869001JA	512 x 8 CMOS PROM, 200ns Access Time	3013
C	HM1-6642B/883	5962-8869002JA	512 x 8 CMOS PROM, 120ns Access Time	3013
N	HM4-6504-8		4096 x 1 CMOS RAM, 300ns Access Time	2994
N	HM4-6504B-8		4096 x 1 CMOS RAM, 200ns Access Time	2994
N	HM4-6514-8		1024 x 4 CMOS RAM, 300ns Access Time	2995
C	HM4-65162	8403603ZA	Ref Only, See Ref SMD P/N.	3000
C	HM4-65162/883	8403602ZA	2048 x 8 CMOS RAM 90ns Access Time	3001
C	HM4-65162B/883	8403606ZA	2048 x 8 CMOS RAM, 70ns Access Time	3001
C	HM4-6516B/883	8403607ZA	2048 x 8 CMOS RAM, 120ns Access Time	2999
C	HM4-65262/883	8413201YA	16K x 1 CMOS RAM, 85ns Access Time	3003
C	HM4-65262B/883	8413203YA	16K x 1 CMOS RAM, 70ns Access Time	3003
C	HM4-65642/883		8192 x 8 CMOS RAM, 150ns Access Time	3004
C	HM4-65642B/883		8192 x 8 CMOS RAM, 150ns Access Time	3004
C	HM4-6617/883	5962-8954001XA	2K x 8 CMOS PROM, 120ns Access Time	3016
C	HM4-6617B/883	5962-8954002XA	2K x 8 CMOS PROM, 90ns Access Time	3016
C	HM4-6642/883	5962-88690013A	512 x 8 CMOS PROM, 200ns Access Time	3013
C	HM6-6617/883	5962-8954001LA	2K x 8 CMOS PROM, 120ns Access Time	3016
C	HM6-6617B/883	5962-8954002LA	2K x 8 CMOS PROM, 90ns Access Time	3016
C	HM6-6642/883	5962-8869001LA	512 x 8 CMOS PROM, 200ns Access Time	3013
C	HM6-6642B/883	5962-8869002LA	512 x 8 CMOS PROM, 120ns Access Time	3013
C	HM9-6516/883		2048 x 8 CMOS RAM, 200ns Access Time	2999
C	HM9-6516B/883		2048 x 8 CMOS RAM, 120ns Access Time	2999
C	HMA510GM-55/883		16 x 16 Digital Multiplier-Accumulator	2807
C	HMA510GM-65/883		16 x 16 Digital Multiplier-Accumulator	2807
C	HMA510GM-75/883		16 x 16 Digital Multiplier-Accumulator	2807

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	HMU16GM-45/883		16 x 16 Digital Multiplier, 68 Lead PGA, 45ns	2804
C	HMU16GM-60/883		16 x 16 Digital Multiplier, 68 Lead PGA, 60ns	2804
C	HMU17GM-45/883		16 x 16 Digital Multiplier, 68 Lead PGA, 45ns	2805
C	HMU17GM-60/883		16 x 16 Digital Multiplier, 68 Lead PGA, 60ns	2805
N	HS1-0506RH-Q		Rad Hard 16-Channel Analog MUX	-
N	HS1-0507RH-Q		Rad Hard Differential 8-Channel Analog MUX	-
N	HS1-0508RH-Q		Rad Hard Single 8-Channel MUX	3977
N	HS1-0509RH-Q		Rad Hard Differential 4-Channel Analog MUX	3977
N	HS1-0546RH-Q		Rad Hard 16-Channel Analog MUX	3544
N	HS1-0547RH-Q		Rad Hard Differential 8-Channel Analog MUX	3544
N	HS1-0548RH-Q		Rad Hard 8-Channel Analog MUX	3543
N	HS1-0549RH-Q		Rad Hard 8-Channel Analog MUX	3543
N	HS1-1840RH-8		Rad Hard 16-Channel CMOS Analog MUX	3992
N	HS1-1840RH-Q		Rad Hard 16-Channel CMOS Analog MUX	3992
C	HS1-1840RH/883		Rad Hard 16-Channel CMOS Analog MUX	3022
C	HS1-1840RH/883S		Rad Hard 16-Channel CMOS Analog MUX	3022
N	HS1-2400RH-Q		Rad Hard Fast Sample/Hold	-
N	HS1-2420RH-Q		Rad Hard Fast Sample/Hold Amplifier	3554
N	HS1-245RH-8		Rad Hard Triple Line Transmitter	3034
N	HS1-245RH-Q		Rad Hard Triple Line Transmitter	3034
N	HS1-246RH-8		Rad Hard Triple Line Receiver	3034
N	HS1-246RH-Q		Rad Hard Triple Line Receiver	3034
N	HS1-248RH-8		Rad Hard Triple Party Line Receiver	3034
N	HS1-248RH-Q		Rad Hard Triple Party Line Receiver	3034
N	HS1-26C31RH-8		Rad Hard RS422 CMOS Line Transmitter	3401
N	HS1-26C31RH-Q		Rad Hard RS422 CMOS Line Transmitter	3401
N	HS1-26C32RH-8		Rad Hard RS422 CMOS Line Receiver	3402
N	HS1-26C32RH-Q		Rad Hard RS422 CMOS Line Receiver	3402
N	HS1-26CT31RH-8		Rad Hard RS422 TTL Line Transmitter	2929
N	HS1-26CT31RH-Q		Rad Hard RS422 TTL Line Transmitter	2929
N	HS1-26CT32RH-8		Rad Hard RS422 TTL Line Receiver	2930
N	HS1-26CT32RH-Q		Rad Hard RS422 TTL Line Receiver	2930
N	HS1-2700RH-Q		Rad Hard High Performance Op Amp	3629
N	HS1-302RH-8		Rad Hard CMOS Analog Switch	-
N	HS1-302RH-Q		Rad Hard CMOS Analog Switch	-
N	HS1-302RH/883		Rad Hard CMOS Analog Switch	3067
N	HS1-303RH-8		Rad Hard CMOS Analog Switch	-
N	HS1-303RH-Q		Rad Hard CMOS Analog Switch	-
N	HS1-303RH/883		Rad Hard CMOS Analog Switch	3067
N	HS1-306RH-8		Withdrawal Date 3/30/96.	-
N	HS1-306RH-Q		Withdrawal Date 3/30/96.	-
N	HS1-307RH-8		Rad Hard CMOS Analog Switch	-
N	HS1-307RH-Q		Rad Hard CMOS Analog Switch	-
C	HS1-307RH/883S		Rad Hard CMOS Analog Switch	3067
N	HS1-3182-8	5962-8687901EA	ARINC Bus Interface Line Driver	2963
N	HS1-3282-8	5962-8688001XA	ARINC Bus Interface Circuit	2964
N	HS1-3374RH-8		Rad Hard 8-Bit Bidirectional CMOS/TTL Level Converter	3038
N	HS1-3374RH-Q		Rad Hard 8-Bit Bidirectional CMOS/TTL Level Converter	3038
N	HS1-384RH-8		Withdrawal Date 3/30/96.	-
N	HS1-384RH-Q		Withdrawal Date 3/30/96	-

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	HS1-390RH-8		Rad Hard CMOS Analog Switch	-
N	HS1-390RH-Q		Rad Hard CMOS Analog Switch	-
C	HS1-390RH/883S		Rad Hard CMOS Analog Switch	3067
N	HS1-508ARH-8		Rad Hard 8-Channel CMOS Analog MUX	-
N	HS1-508ARH-Q		Rad Hard 8-Channel CMOS Analog MUX	-
C	HS1-508ARH/883		Rad Hard 8-Channel CMOS Analog MUX	3021
C	HS1-508ARH/883S		Rad Hard 8-Channel CMOS Analog MUX	3021
N	HS1-54C138RH-8		Rad Hard 3-Line To 8-Line Decoder/DeMUX	3037
N	HS1-54C138RH-Q		Rad Hard 3-Line To 8-Line Decoder/DeMUX	3037
N	HS1-565ARH-Q		Rad Hard 12-Bit D/A Converter	3278
N	HS1-65643RH-8		Rad Hard 64K x 1 SOS SRAM	2794
N	HS1-65643RH-Q		Rad Hard 64K x 1 SOS SRAM	2794
N	HS1-65647RH-8		Rad Hard 8K x 8 SOS SRAM	2928
N	HS1-65647RH-Q		Rad Hard 8K x 8 SOS SRAM	2928
N	HS1-6617RH-8		Rad Hard 2K x 8 CMOS PROM	3033
N	HS1-6617RH-Q		Rad Hard 2K x 8 CMOS PROM	3033
N	HS1-6664RH-8		Rad Hard 8K x 8 CMOS PROM	3197
N	HS1-6664RH-Q		Rad Hard 8K x 8 CMOS PROM	3197
N	HS1-80C85RH-8		Rad Hard 8-Bit CMOS Microprocessor	3036
N	HS1-80C85RH-Q		Rad Hard 8-Bit CMOS Microprocessor	3036
N	HS1-80C86RH-8		Rad Hard 16-Bit CMOS Microprocessor	3035
N	HS1-80C86RH-Q		Rad Hard 16-Bit CMOS Microprocessor	3035
N	HS1-81C55RH-8		Rad Hard 256 x 8 CMOS RAM	3039
N	HS1-81C55RH-Q		Rad Hard 256 x 8 CMOS RAM	3039
N	HS1-81C56RH-8		Rad Hard 256 x 8 CMOS RAM	3039
N	HS1-81C56RH-Q		Rad Hard 256 x 8 CMOS RAM	3039
N	HS1-82C08RH-8		Rad Hard 8-Bit Bus Transceiver	3040
N	HS1-82C08RH-Q		Rad Hard 8-Bit Bus Transceiver	3040
N	HS1-82C12RH-8		Rad Hard 8-Bit Input/Output Port	3041
N	HS1-82C12RH-Q		Rad Hard 8-Bit Input/Output Port	3041
N	HS1-82C37ARH-8		Rad Hard CMOS High Performance Programmable DMA Controller	3042
N	HS1-82C37ARH-Q		Rad Hard CMOS High Performance Programmable DMA Controller	3042
N	HS1-82C54RH-8		Rad Hard CMOS Programmable Interval Timer	3043
N	HS1-82C54RH-Q		Rad Hard CMOS Programmable Interval Timer	3043
N	HS1-82C55ARH-8		Rad Hard CMOS Programmable Peripheral Interface	3191
N	HS1-82C55ARH-Q		Rad Hard CMOS Programmable Peripheral Interface	3191
N	HS1-82C85RH-8		Rad Hard CMOS Static Clock Controller/Generator	3044
N	HS1-82C85RH-Q		Rad Hard CMOS Static Clock Controller/Generator	3044
N	HS1-9008RH-8		Rad Hard 8-Bit Flash A/D Converter	3279
N	HS1-9008RH-Q		Rad Hard 8-Bit Flash A/D Converter	3279
N	HS2-3530RH-8		Rad Hard CMOS Analog Switch	3024
N	HS2-3530RH-Q		Rad Hard CMOS Analog Switch	3024
N	HS4-6617RH-8		Rad Hard 2K x 8 CMOS PROM	3033
N	HS7-2510RH-Q		Rad Hard High Slew Rate Op Amp	3592
N	HS7-2520RH-Q		Rad Hard High Slew Rate Op Amp	3599
N	HS7-2600RH-Q		Rad Hard High Impedance Op Amp	3650
N	HS7-2620RH-Q		Rad Hard High Impedance Wide Band Op Amp	-
N	HS7-2622RH-Q		Rad Hard High Impedance Wide Band Op Amp	-

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	HS8-RTX2010RH-8		Rad Hard 16-Bit Microcontroller	3961
N	HS8-RTX2010RH-Q		Rad Hard 16-Bit Microcontroller	3961
N	HS9-1840RH-8		Rad Hard 16-Channel CMOS Analog MUX	3992-
N	HS9-1840RH-Q		Rad Hard 16-Channel CMOS Analog MUX	3992
C	HS9-1840RH/883		Rad Hard 16-Channel CMOS Analog MUX	3022
C	HS9-1840RH/883S		Rad Hard 16-Channel CMOS Analog MUX, Rad Hard	3022
N	HS9-245RH-8		Rad Hard Triple Line Transmitter	3034
N	HS9-245RH-Q		Rad Hard Triple Line Transmitter	3034
N	HS9-246RH-8		Rad Hard Triple Line Receiver	3034
N	HS9-246RH-Q		Rad Hard Triple Line Receiver	3034
N	HS9-248RH-8		Rad Hard Triple Party Line Receiver	3034
N	HS9-248RH-Q		Rad Hard Triple Party Line Receiver	3034
N	HS9-26C31RH-8		Rad Hard RS422 CMOS Line Transmitter	3401
N	HS9-26C31RH-Q		Rad Hard RS422 CMOS Line Transmitter	3401
N	HS9-26C32RH-8		Rad Hard RS422 CMOS Line Receiver	3402
N	HS9-26C32RH-Q		Rad Hard RS422 CMOS Line Receiver	3402
N	HS9-26CT31RH-8		Rad Hard RS422 TTL Line Transmitter	2929
N	HS9-26CT31RH-Q		Rad Hard RS422 TTL Line Transmitter	2929
N	HS9-26CT32RH-8		Rad Hard RS422 TTL Line Receiver	2930
N	HS9-26CT32RH-Q		Rad Hard RS422 TTL Line Receiver	2930
N	HS9-302RH-8		Rad Hard CMOS Analog Switch	-
N	HS9-302RH-Q		Rad Hard CMOS Analog Switch	-
N	HS9-303RH-8		Rad Hard CMOS Analog Switch	-
N	HS9-303RH-Q		Rad Hard CMOS Analog Switch	-
C	HS9-303RH/883S		Rad Hard CMOS Analog Switch	3067
N	HS9-306RH-8		Withdrawal Date 3/30/96	-
N	HS9-306RH-Q		Withdrawal Date 3/30/96	-
N	HS9-306RH/883S		Withdrawal Date 3/30/96	3067
N	HS9-307RH-8		Rad Hard CMOS Analog Switch, Rad Hard	-
N	HS9-307RH-Q		Rad Hard CMOS Analog Switch	-
N	HS9-3516RH-8		Rad Hard High Slew Rate Op Amp	-
N	HS9-3516RH-Q		Withdrawal Date 3/30/96	-
N	HS9-390RH-8		Rad Hard CMOS Analog Switch	-
N	HS9-390RH-Q		Rad Hard CMOS Analog Switch	-
C	HS9-390RH/883S		Rad Hard CMOS Analog Switch	3067
N	HS9-508ARH-8		Rad Hard 8-Channel CMOS Analog MUX	-
N	HS9-508ARH-Q		Rad Hard 8-Channel CMOS Analog MUX	-
C	HS9-508ARH/883		Rad Hard 8-Channel CMOS Analog MUX	-
C	HS9-508ARH/883S		Rad Hard 8-Channel CMOS Analog MUX	3021
N	HS9-54C138RH-8		Rad Hard 3-Line To 8-Line Decoder/DeMUX	3037
N	HS9-54C138RH-Q		Rad Hard 3-Line To 8-Line Decoder/DeMUX	3037
N	HS9-565ARH-Q		Rad Hard 12-Bit D/A Converter	3278
N	HS9-65643RH-8		Rad Hard 64K x 1 SOS SRAM	2794
N	HS9-65643RH-Q		Rad Hard 64K x 1 SOS SRAM	2794
N	HS9-65647RH-8		Rad Hard 8K x 8 SOS SRAM	2928
N	HS9-65647RH-Q		Rad Hard 8K x 8 SOS SRAM	2928
N	HS9-6617RH-8		Rad Hard 2K x 8 CMOS PROM	3033
N	HS9-6617RH-Q		Rad Hard 2K x 8 CMOS PROM	3033
N	HS9-6664RH-8		Rad Hard 8K x 8 CMOS PROM	3197
N	HS9-6664RH-Q		Rad Hard 8K x 8 CMOS PROM	3197

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	HS9-80C85RH-8		Rad Hard 8-Bit CMOS Microprocessor	3036
N	HS9-80C85RH-Q		Rad Hard 8-Bit CMOS Microprocessor	3036
N	HS9-80C86RH-8		Rad Hard 16-Bit CMOS Microprocessor	3035
N	HS9-80C86RH-Q		Rad Hard 16-Bit CMOS Microprocessor	3035
N	HS9-81C55RH-8		Rad Hard 256 x 8 CMOS RAM	3039
N	HS9-81C55RH-Q		Rad Hard 256 x 8 CMOS RAM	3039
N	HS9-81C56RH-8		Rad Hard 256 x 8 CMOS RAM	3039
N	HS9-81C56RH-Q		Rad Hard 256 x 8 CMOS RAM	3039
N	HS9-82C08RH-8		Rad Hard 8-Bit Bus Transceiver	3040
N	HS9-82C08RH-Q		Rad Hard 8-Bit Bus Transceiver	3040
N	HS9-82C12RH-8		Rad Hard 8-Bit Input/Output Port	3041
N	HS9-82C12RH-Q		Rad Hard 8-Bit Input/Output Port	3041
N	HS9-82C37ARH-8		Rad Hard CMOS High Performance Programmable DMA Controller	3042
N	HS9-82C37ARH-Q		Rad Hard CMOS High Performance Programmable DMA Controller	3042
N	HS9-82C54RH-8		Rad Hard CMOS Programmable Interval Timer	3043
N	HS9-82C54RH-Q		Rad Hard CMOS Programmable Interval Timer	3043
N	HS9-82C85RH-8		Rad Hard CMOS Static Clock Controller/Generator	3044
N	HS9-82C85RH-Q		Rad Hard CMOS Static Clock Controller/Generator	3044
N	HS9-9008RH-8		Rad Hard 8-Bit Flash A/D Converter	3279
N	HS9-9008RH-Q		Rad Hard 8-Bit Flash A/D Converter	3279
N	HS9-RTX2010RH-8		Rad Hard 16-Bit Microcontroller	3961
N	HS9-RTX2010RH-Q		Rad Hard 16-Bit Microcontroller	3961
N	HS9A65643RH-Q		Rad Hard 64K x 1 SOS SRAM	2794
N	HS9A65647RH-Q		Rad Hard 8K x 8 SOS SRAM	2928
C	HSP43168GM-25/883		Dual Digital Filter 85 Lead PGA, 25MHz	3177
C	HSP43168GM-33/883		Dual Digital Filter 85 Lead PGA, 33MHz	3177
C	HSP43220GM-15/883		Decimating Digital Filter 84 Lead PGA, 15MHz	2802
C	HSP43220GM-25/883		Decimating Digital Filter 84 Lead PGA, 25MHz	2802
N	HSP43220TM-15		Decimating Digital Filter 84 Lead Tab, 15MHz	2486
N	HSP43220TM-25		Decimating Digital Filter 84 Lead Tab, 25MHz	2486
C	HSP43481GM-20/883		4 Tap, FIR Filter (8-Bit) 20MHz, 68 Lead PGA	2450
C	HSP43481GM-25/883		4 Tap, FIR Filter (8-Bit) 25.6MHz, 68 Lead PGA	2450
C	HSP43881GM-20/883		8 Tap, FIR Filter (8-Bit) 20MHz, 85 Lead PGA	2449
C	HSP43881GM-25/883		8 Tap, FIR Filter (8-Bit) 25.6MHz, 85 Lead PGA	2449
C	HSP43891GM-20/883	5962-9209701MX	8 Tap, 9-Bit FIR Filter, 85 Lead PGA, Dual Brand	2451
C	HSP43891GM-25/883	5962-9209702MX	8 Tap, 9-Bit FIR Filter, 85 Lead PGA, Dual Brand	2451
C	HSP45106GM-25/883		16-Bit Numerically Controlled Oscillator, 85 Lead PGA	2815
C	HSP45106GM-30/883		16-Bit Numerically Controlled Oscillator, 85 Lead PGA	2815
C	HSP45116GM-15/883		16-Bit Numerically Controlled Oscillator/Modulator, 144 Lead PGA	2813
C	HSP45116GM-25/883		16-Bit Numerically Controlled Oscillator/Modulator, 144 Lead PGA	2813
N	HSP45116TM-15		Numerically Controlled Oscillator, 156 Lead TAB Tape	2485
N	HSP45116TM-25		Numerically Controlled Oscillator, 156 Lead TAB Tape	2485
C	HSP45240GM-25/883		Address Sequencer, 68 Lead PGA, 25.6MHz	2816
C	HSP45240GM-33/883		Address Sequencer, 68 Lead PGA, 33MHz	2816
C	HSP45240GM-40/883		Address Sequencer, 68 Lead PGA, 40MHz	2816
C	HSP45256GM-20/883		Binary Correlator, 20MHz, 85 Lead PGA	2997

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	HSP45256GM-25/883		Binary Correlator, 25.6MHz, 85 Lead PGA	2997
C	HSP48410GM-25/883	5962-9457301MX	Histogrammer, 33MHz, 25 Lead PGA, Dual Brand	3542
C	HSP48410GM-33/883	5962-9457302MX	Histogrammer, 33MHz, 84 Lead PGA, Dual Brand	3542
C	HSP48908GM-20/883	5962-9300701MX	2-Dimensional Convolver, 20MHz, 84 Lead PGA, Dual Brand	2783
C	HSP48908GM-27/883		3 x 3 2-Dimensional Convolver, 27MHz, 84 Lead PGA	2783
C	HV400MJ/883		High Current MOSFET Driver, 8 Lead SBDIP	3584
C	ICL232MJE/883B		Dual Transmitter Receiver, +5V, 16 Lead CDIP	-
C	ICL7109MDL/883B		A/D Microprocessor, 12-Bit, 40 Lead SBDIP	3092
N	ICL7650SMJD/HR		Precision Op Amp, 20mV	2920
N	ICL7650SMTV1HR		Precision Op Amp, 20mV, 8 Lead Can	2920
C	ICL7660MTV/883B		Voltage Converter, 8 Lead Can	-
C	ICL7660SMTV/883B		Voltage Converter, 8 Lead Can	-
C	ICL7662MTV/883B		CMOS 20V Voltage Converter, 8 Pin Can	-
C	ICL7667MJA/883B	5962-8766001PA	Dual Power MOS Driver, 8 Lead CDIP	-
C	ICL7667MTV/883B	5962-8766001G	Dual Power MOS Driver, 8 Lead Can	-
N	ICL8013BMTX/HR		Multiplier, 1.0%, 10 Lead Can	2863
N	ICL8013CMTX/HR		Multiplier, 2.0%, 10 Lead Can	2863
C	ICL8038AMJD/883B	5962-8877201CA	Waveform Generator, 250ppm (Max), 14 Lead CDIP	-
C	ICL8038BMJD/883B		Waveform Generator, 350ppm (Max), 14 Lead CDIP	-
N	ICL8038CCJD/BI		Waveform Generator, 350ppm (Typ), 14 Lead CDIP	2864
N	ICL8048BCJE/HR		Log Amp, 0%, 16 Lead CDIP	-
C	ICL8069CMSQ/883B		Voltage Reference, 50ppm Band-Gap, 2 Lead Can (TO-52)	-
C	ICL8069DMSQ/883B		Voltage Reference, 100ppm Band-Gap, 2 Lead Can (TO-52)	-
C	ICL8211MTY/883B	5962-8984201G	Voltage Reference, Indicator, 8 Lead Can	-
C	ICL8212MTY/883B	5962-8984202G	Voltage Reference, Indicator, 8 Lead Can	-
C	ICM7170AMDG/883B	5962-8765301JA	Real Time Clock, µP, 20 Lead SBDIP	-
C	ICM7170MDG/883B		Real Time Clock, µP, 20 Lead SBDIP	-
C	ICM7228AMJI883B		Universal LED Driver Compatible A, 28 Lead CDIP, 8-Digit	-
C	ICM7228BMJI883B		Universal LED Driver Compatible C, 28 Lead CDIP, 8-Digit	-
C	ICM7228CMJI883B		Universal LED Driver Compatible A, 28 Lead CDIP, 8-Digit	-
C	ICM7228DMJI883B		Universal LED Driver Compatible C, 28 Lead CDIP, 8-Digit	-
C	ICM7555MTV/883B	5962-8950303G	CMOS 555 Timer, 8 Lead Can	-
C	ICM7556IPD/BI	ICM7556IPD	Withdraw Date 9/30/95: See Ref Substitute P/N.	-
C	ICM7556MJD/883B	5962-8950304CA	CMOS 556 Dual Timer, 14 Lead CDIP	-
C	IH5012MDE/883B		Analog Switch, 16 Lead CDIP, 5.0V Quad	-
	IH5040MDE	JM38510/10501BEA	See Ref P/N	-
	IH5041MDE	JM38510/10502BEA	See Ref P/N	-
	IH5042MDE	JM38510/10503BEA	See Ref P/N	-
	IH5043MDE	JM38510/10504BEA	See Ref P/N	3130
C	IH5043MJE/883B	8100604EA	Analog Switch, 16 Lead CDIP, 15V Dual SPDT CMOS	3130
	IH5044MDE	JM38510/10505BEA	See Ref P/N	-
	IH5045MDE	JM38510/10506BEA	See Ref P/N	-
C	IH5140MJE/883B	8100609EA/INT	Analog Switch, 16 Lead CDIP, 15V SPST CMOS	3132
C	IH5141MJE/883B	8100610EA/INT	Analog Switch, 16 Lead CDIP, 15V Dual SPST CMOS	3132
C	IH5142MJE/883B	8100611EA/INT	Analog Switch, 16 Lead CDIP, 15V SPDT CMOS	3132
C	IH5143MJE/883B	8100612EA/INT	Analog Switch, 16 Lead CDIP, 15V Dual SPDT CMOS	3132
C	IH5144MJE/883B	8100613EA/INT	Analog Switch, 16 Lead CDIP, 15V DPST CMOS	3132
C	IH5145MJE/883B	8100614EA/INT	Analog Switch, 16 Lead CDIP, 15V Dual DPST CMOS	3132
C	IH5151MJE/883B	8100622EA/INT	Analog Switch, 16 Lead CDIP, 15V Dual SPDT CMOS	3133
C	IH5341MTW/883B		RF/Video Switch, 10 Pin Can, 15V Dual SPST	3134

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	IH5352MJE/883B	5962-8875001EA	RF/Video Switch, 16 Lead CDIP, 15V Quad SPST CMOS	3134
C	IH6108MJE/883B		Analog MUX, 16 Lead CDIP, 15V 8-Channel CMOS	3156
C	IH6201MJE/883B		Driver/Translator, 16 Lead CDIP, 15V Dual CMOS	3136
C	IH6208MJE/883B		Analog MUX, 16 Lead CDIP, 15V Differential 4-Channel CMOS	3157
C	JM38510/05001BCA	CD4011AFB	Quad 2-Input NAND Gate	-
C	JM38510/05003BCA	CD4011BFB	Quad 2-Input NAND Gate	-
C	JM38510/05051BCA	CD4011BFB	Quad 2-Input NAND Gate	-
C	JM38510/05052BCA	CD4012BFB	Dual 4-Input NAND Gate	-
C	JM38510/05053BCA	CD4023BFB	Triple 3-Input NAND Gate	-
C	JM38510/05101BCA	CD4013AFB	Dual D-Type Flip-Flop with Set/Reset Capabilities	-
C	JM38510/05102BEA	CD4027AFB	Dual J-K Flip-Flop with Set/Reset Capabilities	-
C	JM38510/05151BCA	CD4013BFB	Dual D-Type Flip-Flop with Set/Reset Capabilities	-
C	JM38510/05152BEA	CD4027BFB	Dual J-K Flip-Flop with Set/Reset Capabilities	-
C	JM38510/05201BCA	CD4000AFB	Dual 3-Input NOR Gate Plus Inverter	-
C	JM38510/05202BCA	CD4001AFB	Quad 2-Input NOR Gate	-
C	JM38510/05204BCA	CD4025AFB	Triple 3-Input NOR Gate	-
C	JM38510/05252BCA	CD4001BFB	Quad 2-Input NOR Gate	-
C	JM38510/05254BCA	CD4025BFB	Triple 3-Input NOR Gate	-
C	JM38510/05301BCA	CD4007AFB	Dual Complementary Pair Plus Inverter	-
C	JM38510/05302BEA	CD4019AFB	Quad AND/OR Select Gate	-
C	JM38510/05352BEA	CD4019BFB	Quad AND/OR Select Gate	-
C	JM38510/05353BCA	CD4030BFB	Presettable Up/Down Counter	-
C	JM38510/05503BEA	CD4049AFB	Hex Buffer/Converter, Inverting	-
C	JM38510/05504BEA	CD4050AFB	Hex Buffer/Converter, Non-Inverting	-
C	JM38510/05553BEA	CD4049UBFB	Hex Buffer/Converter, Inverting	-
C	JM38510/05554BEA	CD4050BFB	Hex Buffer/Converter, Inverting	-
C	JM38510/05601BEA	CD4017AFB	Decade Counter/Divider	-
C	JM38510/05603BEA	CD4020AFB	14-Stage Binary Ripple Counter	-
C	JM38510/05605BCA	CD4024AFB	7-Stage Binary Ripple Counter	-
C	JM38510/05651BEA	CD4017BFB	Decade Counter/Divider	-
C	JM38510/05652BEA	CD4018BFB	Presettable Divide-by-N Counter	-
C	JM38510/05653BEA	CD4020BFB	14-Stage Binary Ripple Counter	-
C	JM38510/05655BCA	CD4024BFB	7-Stage Binary Ripple Counter	-
C	JM38510/05754BEA	CD4021BFB	8-Stage Static Shift Register	-
C	JM38510/05852BCA	CD4066BFB	Quad Bilateral Switch	-
C	JM38510/10501BEA	IH5040MDE	SPST CMOS Analog Switch	-
C	JM38510/10502BEA	IH5041MDE	Dual SPST CMOS Analog Switch	-
C	JM38510/10503BEA	IH5042MDE	SPDT CMOS Analog Switch	-
C	JM38510/10504BEA	IH5043MDE	Dual SPDT CMOS Analog Switch	-
C	JM38510/10505BEA	IH5044MDE	DPST CMOS Analog Switch	-
C	JM38510/10506BEA	IH5045MDE	Dual DPST CMOS Analog Switch	-
C	JM38510/11601BCA	DG300AAP	Dual SPST CMOS Analog Switch	-
C	JM38510/11602BCA	DG301AAP	SPDT CMOS Analog Switch	-
C	JM38510/11603BCA	DG302AAP	Dual DPST CMOS Analog Switch	-
C	JM38510/11604BCA	DG303AAP	Dual SPDT CMOS Analog Switch	-
C	JM38510/12202BGA	HA2-2600	High Slew Rate Op Amp	-
C	JM38510/12202BPA	HA7-2600	High Slew Rate Op Amp	-
C	JM38510/12203BGA	HA2-2620	High Slew Rate Op Amp	-
C	JM38510/12203BPA	HA7-2620	High Slew Rate Op Amp	-

See Section 1 for complete selection guide, page number reference, and file number listing.

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	JM38510/12204BGA	HA2-2500	High Slew Rate Op Amp	-
C	JM38510/12204BPA	HA7-2500	High Slew Rate Op Amp	-
C	JM38510/12205BGA	HA2-2510	High Slew Rate Op Amp	-
C	JM38510/12205BPA	HA7-2510	High Slew Rate Op Amp	-
C	JM38510/12206BGA	HA2-2520	High Slew Rate Op Amp	-
C	JM38510/12206BPA	HA7-2520	High Slew Rate Op Amp	-
C	JM38510/12302BEA	DG201AAP	Quad SPST CMOS Analog Switch	-
C	JM38510/17001BCA	CD4081BFB	Quad 2-Input AND Gate	-
C	JM38510/17002BCA	CD4082BFB	Dual 4-Input AND Gate	-
C	JM38510/17003BCA	CD4073BFB	Triple 3-Input AND Gate	-
C	JM38510/17101BCA	CD4071BFB	Quad 2-Input OR Gate	-
C	JM38510/17103BCA	CD4075BFB	Triple 3-Input OR Gate	-
C	JM38510/17203BCA	CD4070BFB	Quad Exclusive-OR Gate	-
C	JM38510/17401BCA	CD4069UBFB	Hex Inverter	
C	JM38510/17403BEA	CD4502BFB	Strobed Hex Inverter/Buffer	-
C	JM38510/17504BEA	CD4098BFB	Dual Monostable Multivibrator	-
C	JM38510/17601BEA	CD4099BFB	8-Bit Addressable Latch	-
C	JM38510/19001BXA	HI1-0506	16-Channel CMOS Analog MUX	-
C	JM38510/19002BXA	HI1-0546	16-Channel Over-Voltage Protected CMOS Analog MUX	-
C	JM38510/19003BXA	HI1-0507	8-Channel Differential CMOS Analog MUX	-
C	JM38510/19004BXA	HI1-0547	8-Channel Differential Over-Voltage Protected CMOS MUX	-
C	JM38510/19005BEA	HI1-0548	8-Channel Over-Voltage Protected CMOS MUX	-
C	JM38510/19006BEA	HI1-0549	4-Channel Differential Over-Voltage Protected CMOS MUX	-
C	JM38510/19007BEA	HI1-0508	8-Channel CMOS Analog MUX	-
C	JM38510/19008BEA	HI1-0509	4-Channel Differential CMOS Analog MUX	-
C	JM38510H05051BCA	CD4011BFBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05051SCA	CD4011BFSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05053BCA	CD4023BFBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05053BTC	CD4023BQBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05053STC	CD4023BQSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05151BTC	CD4013BQBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05151STC	CD4013BQSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05152BEA	CD4027BFBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05152BNC	CD4027BQBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05152SEA	CD4027BFSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05152SNC	CD4027BQSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05252BTC	CD4001BQBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05252BCA	CD4001BFBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05252BTC	CD4001BQBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05252SCA	CD4001BFSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05252STC	CD4001BQSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05254BCA	CD4025BFBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05254BTC	CD4025BQBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05254SCA	CD4025BFSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05254STC	CD4025BQSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05351BCA	CD4007UBFBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05351BTC	CD4007UBQBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05351STC	CD4007UBQSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05352BEA	CD4019BFBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05352BNC	CD4019BQBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	JM38510H05352SEA	CD4019BFSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05352SNC	CD4019BQSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05353BCA	CD4030BFBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05353BTC	CD4030BQBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05353SCA	CD4030BFSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05353STC	CD4030BQSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05553BEA	CD4049UBFBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05553BNC	CD4049UBQBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05553SEA	CD4049UBFSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05553SNC	CD4049UBQSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05554BEA	CD4050BFBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05554BNC	CD4050BQBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05554SEA	CD4050BFSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05554SNC	CD4050BQSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05651BEA	CD4017BFBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05651BNC	CD4017BQBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05651SEA	CD4017BFSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05652BNC	CD4018BQBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05652SEA	CD4018BFSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05652SNC	CD4018BQSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05653BEA	CD4020BFBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05653BNC	CD4020BQBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05653SEA	CD4020BFSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05653SNC	CD4020BQSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05654BEA	CD4022BFBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05654BNC	CD4022BQBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05654SEA	CD4022BFSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05654SNC	CD4022BQSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05655BCA	CD4024BFBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05655BTC	CD4024BQBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05655SCA	CD4024BFSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05655STC	CD4024BQSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05752BEA	CD4014BFBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05752BNC	CD4014BQBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05752SEA	CD4014BFSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05752SNC	CD4014BQSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05753BEA	CD4015BFBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05753BNC	CD4015BQBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05753SEA	CD4015BFSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05753SNC	CD4015BQSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05754BEA	CD4021BFBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05754BNC	CD4021BQBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05754SEA	CD4021BFSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05754SNC	CD4021BQSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05852BCA	CD4066BFBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05852BTC	CD4066BQBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05852SCA	CD4066BFSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H05852STC	CD4066BQSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H17001BCA	CD4081BFBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H17001BTC	CD4081BQBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1

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C	JM38510H17001SCA	CD4081BFSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H17001STC	CD4081BQSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H17101BCA	CD4071BFBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H17101BTC	CD4071BQBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H17101SCA	CD4071BFSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H17101STC	CD4071BQSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H17103BCA	CD4075BFBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H17103BTC	CD4075BQBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H17103SCA	CD4075BFSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H17103STC	CD4075BQSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H17201BCA	CD4085BFBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H17201BTC	CD4085BQBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H17201SCA	CD4085BFSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H17201STC	CD4085BQSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H17202BCA	CD4086BFBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H17202BTC	CD4086BQBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H17202SCA	CD4086BFSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H17202STC	CD4086BQSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H17203BCA	CD4070BFBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H17203BTC	CD4070BQBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H17203SCA	CD4070BFSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H17203STC	CD4070BQSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H17401BCA	CD4069UBFBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H17401BTC	CD4069UBQBH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H17401SCA	CD4069UBFSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510H17401STC	CD4069UBQSH	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05051BCA	CD4011BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05053BTC	CD4023BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05053STC	CD4023BQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05151BTC	CD4013BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05151STC	CD4013BQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05152BEA	CD4027BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05152BNC	CD4027BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05152SEA	CD4027BFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05152SNC	CD4027BQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05252BCA	CD4027BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05252BTC	CD4001BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05252SCA	CD4001BFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05252STC	CD4001BQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05253BCA	CD4002BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05253BTC	CD4002BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05253SCA	CD4002BFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05253STC	CD4002BQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05254BCA	CD4025BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05254BTC	CD4025BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05254SCA	CD4025BFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05254STC	CD4025BQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05351BCA	CD4007UBFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05351BTC	CD4007UBQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05351SCA	CD4007UBFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	JM38510R05351STC	CD4007UBQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05352BEA	CD4019BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05352BNC	CD4019BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05352SEA	CD4019BFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05352SNC	CD4019BQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05353BCA	CD4030BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05353BNC	CD4030BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05353SCA	CD4030BFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05353STC	CD4030BQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05451BEA	CD4008BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05451BNC	CD4008BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05451SEA	CD4008BFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05451SNC	CD4008BQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05553BEA	CD4049UBFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05553BNC	CD4049UBQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05553SEA	CD4049UBFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05553SNC	CD4049UBQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05554BEA	CD4050BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05554BNC	CD4050BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05554SEA	CD4050BFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05554SNC	CD4050BQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05555BCA	CD4041UBFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05555BTC	CD4041UBQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05555SCA	CD4041UBFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05555STC	CD4041UBQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05651BEA	CD4017BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05651BNC	CD4017BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05651SEA	CD4017BFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05652BEA	CD4018BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05652BNC	CD4018BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05652SEA	CD4018BFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05652SNC	CD4018BQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05653BEA	CD4020BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05653BNC	CD4020BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05653SEA	CD4020BFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05653SNC	CD4020BQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05654BEA	CD4022BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05654BNC	CD4022BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05654SEA	CD4022BFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05654SNC	CD4022BQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05655BCA	CD4024BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05655BTC	CD4024BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05655SCA	CD4024BFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05655STC	CD4024BQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	JM38510R05752BEA	CD4014BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05752BNC	CD4014BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05752SEA	CD4014BFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05752SNC	CD4014BQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05753BEA	CD4015BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05753BNC	CD4015BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05753SEA	CD4015BFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05753SNC	CD4015BQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05754BEA	CD4021BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05754BNC	CD4021BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05754SEA	CD4021BFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05754SNC	CD4021BQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05852BCA	CD4066BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05852BTC	CD4066BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05852SCA	CD4066BFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05852STC	CD4066BQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05951BEA	CD4028BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05951BNC	CD4028BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05951SEA	CD4028BFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R05951SNC	CD4028BQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17001BCA	CD4081BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17001BTC	CD4081BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17001SCA	CD4081BFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17001STC	CD4081BQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17002BCA	CD4082BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17002BTC	CD4082BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17003BCA	CD4073BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17003BTC	CD4073BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17101BCA	CD4071BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17101BTC	CD4071BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17101SCA	CD4071BFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17101STC	CD4071BQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17102BCA	CD4072BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17102BTC	CD4072BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17103BCA	CD4075BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17103BTC	CD4075BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17103SCA	CD4075BFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17103STC	CD4075BQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17201BCA	CD4085BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17201BTC	CD4085BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17201SCA	CD4085BFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17201STC	CD4085BQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17202BCA	CD4086BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17202BTC	CD4086BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1

See Section 1 for complete selection guide, page number reference, and file number listing.

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COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	JM38510R17202SCA	CD4086BFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17202STC	CD4086BQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17203BCA	CD4070BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17203BTC	CD4070BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17203SCA	CD4070BFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17203STC	CD4070BQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17204BCA	CD4077BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17204BTC	CD4077BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17401BCA	CD4069UBFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17401BTC	CD4069UBQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17401SCA	CD4069UBFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17401STC	CD4069UBQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17403BEA	CD4502BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17403BNC	CD4502BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17403SEA	CD4502BFSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17403SNC	CD4502BQSR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17504BEA	CD4098BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17504BNC	CD4098BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17601BEA	CD4099BFBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	JM38510R17601BNC	CD4099BQBR	Ref Only; Order as Reference Harris Part Number; Rad Hard	Note 1
C	M83530/1-2000B		MIL MOV 200V	-
C	M83530/1-2200D		MIL MOV 220V	-
C	M83530/1-4300E		MIL MOV 430V	-
C	M83530/1-5100E		MIL MOV 510V	-
C	MD80C86-2/883	8405202QA	CMOS 16-Bit CPU - 8MHz, 40 Lead CDIP	-
N	MD80C86-2/B		CMOS 16-Bit CPU - 8MHz, 40 Lead CDIP	2957
C	MD80C86/883	8405201XA	CMOS 16-Bit CPU - 5MHz, 40 Lead CDIP	-
N	MD80C86/B		CMOS 16-Bit CPU - 5MHz, 40 Lead CDIP	2957
C	MD80C88-2/883		CMOS 8/16-Bit CPU - 8MHz, 40 Pin CDIP	-
N	MD80C88-2/B		CMOS 8/16-Bit CPU - 8MHz, 40 Lead CDIP	2949
C	MD80C88/883	5962-8601601QA	CMOS 8/16-Bit CPU - 5MHz. 40 Lead CDIP	-
N	MD80C88/B		CMOS 8/16-Bit CPU - 5MHz, 40 Lead CDIP	2949
N	MD82C237-12/B	5962-9053404MQA	CMOS DMA Controller - 12MHz, 5.0V, 40 CDIP	2965
N	MD82C237/B		CMOS DMA Controller - 8MHz, 5.0V, 40 CDIP	2965
C	MD82C284-10/883		CMOS Clock Generator/Driver - 10MHz, 5.0V, 18 Lead CDIP	2968
C	MD82C284-12/883		CMOS Clock Generator/Driver - 12MHz, 5.0V, 18 Lead CDIP	2968
N	MD82C37A-12/B	5962-9054303MQA	CMOS DMA Controller - 12MHz, 5.0V, 40 Lead CDIP	2967
N	MD82C37A-5/B		CMOS DMA Controller - 5MHz, 40 Lead CDIP	2967
N	MD82C37A/B	5962-9054302MQA	CMOS DMA Controller - 8MHz, 40 Lead CDIP	2967
N	MD82C50A-5/B		CMOS Asynchronous Comm Elem - 5MHz, 40 Lead CDIP	2958
N	MD82C52/B	8501501XA	CMOS Serial Comm I/F - 28 Lead CDIP	2950
N	MD82C54-10/B		CMOS Programmable Interval Timer - 10MHz, 24 Lead CDIP	2970
N	MD82C54-12/B		CMOS Programmable Interval Timer - 12MHz, 24 Lead CDIP	-
N	MD82C54/B	8406501JA	CMOS Programmable Interval Timer - 8MHz, 24 Lead CDIP	2970

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
N	MD82C55A-5/B	8406601QA	CMOS Programmable Peripheral I/F - 5MHz, 40 Lead CDIP	2969
N	MD82C55A/B	8406602QA	CMOS Programmable Peripheral I/F - 8MHz, 40 Lead CDIP	2969
N	MD82C59A-12/B		CMOS Interrupt Controller - 12MHz, 28 Lead CDIP	-
N	MD82C59A-5/B	5962-8501601YA	CMOS Interrupt Controller - 5MHz, 28 Lead CDIP	2784
N	MD82C59A/B	5962-8501602YA	CMOS Interrupt Controller - 8MHz, 28 Lead CDIP	2784
N	MD82C82/B	8406701RA	CMOS Octal Latching Channel Bus Driver - 20 Lead CDIP	2975
N	MD82C83H/B	8406702RA	CMOS Inverting Octal Latching Channel Driver - 20 Lead CDIP	2971
N	MD82C84A/B	8406801VA	CMOS Clock Generator - 8MHz, 20 Lead CDIP	2974
C	MD82C85/B		CMOS Static Clock Controller - 8MHz, 24 Lead CDIP	2976
N	MD82C86H-5/B	5962-8757701RA	CMOS Octal Transceiver - 5MHz, 20 Lead CDIP	2977
N	MD82C87H-5/B	5962-8757702RA	CMOS Octal Transceiver - 5MHz, 20 Lead CDIP	2978
N	MD82C88/B	8406901RA	CMOS Bus Controller - 8MHz, 20 Lead CDIP	2979
N	MD82C89/B	5962-8552801RA	CMOS Bus Arbiter - 8MHz, 20 Lead CDIP	2980
C	MG80C286-10/883	5962-9067801MX	CMOS 16-Bit CPU - 10MHz, 5.0V, 68 Lead PGA	2948
C	MG80C286-12/883	5962-9067802MX	CMOS 16-Bit CPU - 12MHz, 5.0V, 68 Lead PGA	2948
C	MR80C86-2/883	8405202XA	CMOS 16-Bit CPU - 8MHz, 44 Lead LCC	-
N	MR80C86-2/B		CMOS 16-Bit CPU - 8MHz, 44 Lead LCC	2957
C	MR80C86/883	8405201XA	CMOS 16-Bit CPU - 5MHz, 44 Lead LCC	-
N	MR80C86/B		CMOS 16-Bit CPU - 5MHz, 44 Lead LCC	2957
C	MR80C88-2/883		CMOS 8/16-Bit CPU - 8MHz, 44 Lead LCC	-
N	MR80C88-2/B		CMOS 8/16-Bit CPU - 8MHz, 44 Lead LCC	2949
C	MR80C88/883	5962-8601601XA	CMOS 8/16-Bit CPU - 5MHz, 44 Lead LCC	-
N	MR80C88/B		CMOS 8/16-Bit CPU - 5MHz, 44 Lead LCC	2949
N	MR82C237-12/B		CMOS DMA Controller - 12MHz, 5.0V, 44 Lead LCC	2965
N	MR82C237/B	5962-9054302MXA	CMOS DMA Controller - 8MHz, 5.0V, 44 Lead LCC	2965
N	MR82C37A-12/B		CMOS DMA Controller - 12MHz, 5.0V, 44 Lead LCC	2967
N	MR82C37A-5/B	5962-9054301MXA	CMOS DMA Controller - 5MHz, 44 Lead LCC	2967
N	MR82C37A/B		CMOS DMA Controller - 8MHz, 44 Lead LCC	2967
N	MR82C52/B	85015013A	CMOS Serial Comm I/F - 28 Lead LCC	2950
N	MR82C54-10/B		CMOS Programmable Interval Timer - 10MHz, 28 Lead LCC	2970
N	MR82C54-12/B		CMOS Programmable Interval Timer - 12MHz, 28 Lead LCC	-
N	MR82C54/B	84065013A	CMOS Programmable Interval Timer - 8MHz, 28 Lead LCC	2970
N	MR82C55A-5/B		CMOS Programmable Peripheral I/F - 5MHz, 44 Lead LCC	2969
N	MR82C55A/B	8406602XA	CMOS Programmable Peripheral I/F - 8MHz, 44 Lead LCC	2969
N	MR82C59A-12/B		CMOS Interrupt Controller - 8MHz, 28 Lead LCC	-
N	MR82C59A-5/B	8406601XA	CMOS Interrupt Controller - 5MHz, 28 Lead LCC	2784
N	MR82C59A/B	5962-85016023A	CMOS Interrupt Controller - 8MHz, 28 Lead LCC	2784
N	MR82C82/B	84067012A	CMOS Octal Latchable Bus Driver - 20 Lead LCC	2975
N	MR82C83H/B	84067022A	CMOS Inverting Octal Latchable Driver - 20 Lead LCC	2971
N	MR82C84A/B	84068012A	CMOS Clock Generator - 8MHz, 20 Lead LCC	2974
N	MR82C85/B		CMOS Static Clock Controller - 8MHz, 28 Lead LCC	2976
N	MR82C86H-5/B	5962-87577012A	CMOS Octal Inverting Transceiver - 5MHz, 20 Lead LCC	2977
N	MR82C87H-5/B	5962-87577022A	CMOS Octal Inverting Transceiver - 5MHz, 20 Lead LCC	2978
N	MR82C88/B	84069012A	CMOS Bus Controller - 8MHz, 20 Lead LCC	2979
N	MR82C89/B	5962-85528012A	CMOS Bus Arbiter- 8MHz, 20 Lead LCC	2980

See Section 1 for complete selection guide, page number reference, and file number listing.

PART NUMBER LISTING

COMPLIANT OR NON-COMPLIANT	MARKETING PART NUMBER	REFERENCE NUMBER	DESCRIPTION	FILE NO.
C	RTX2000GM-8/883		Microcontroller - 8MHz, 84 pin CPGA	-
N	SP720MD		ESD Protection Array - 16 Lead CerDIP	3683
N	SP720MD-8		ESD Protection Array - 16 Lead CerDIP	3683
N	SM720MM		ESD Protection Array - 28 Lead LCC	3683
N	SP720MM-8		ESD Protection Array - 28 Lead LCC	3683
C	V12ZTX1		TX MIL MOV	-
C	V12ZTX2		TX MIL MOV	-
C	V130LTX10A		TX MIL MOV	-
C	V130LTX2		TX MIL MOV	-
C	V130LTX20B		TX MIL MOV	-
C	V150LTX10A		TX MIL MOV	-
C	V150LTX2		TX MIL MOV	-
C	V150LTX20B		TX MIL MOV	-
C	V22ZTX1		TX MIL MOV	-
C	V22ZTX3		TX MIL MOV	-
C	V24ZTX50		TX MIL MOV	-
C	V250LTX20A		TX MIL MOV	-
C	V250LTX4		TX MIL MOV	-
C	V250LTX40B		TX MIL MOV	-
C	V33ZTX1		TX MIL MOV	-
C	V33ZTX5		TX MIL MOV	-
C	V33ZTX70		TX MIL MOV	-
C	V420LTX20A		TX MIL MOV	-
C	V420LTX40B		TX MIL MOV	-
C	V480LTX40A		TX MIL MOV	-
C	V480LTX80B		TX MIL MOV	-
C	V510LTX40A		TX MIL MOV	-
C	V510LTX80B		TX MIL MOV	-
C	V68ZTX10		TX MIL MOV	-
C	V68ZTX2		TX MIL MOV	-
C	V82ZTX12		TX MIL MOV	-
C	V82ZTX2		TX MIL MOV	-
C	V8ZTX1		TX MIL MOV	-
C	V8ZTX2		TX MIL MOV	-

NOTE:

1. These Rad Hard JAN CD4000 Series Logic IC devices will be replaced as of January 1, 1996, with the equivalent device type under a QML Standard Microcircuit Drawing (SMD). These SMD devices may differ slightly in performance specifications from the JAN device, but form, fit, and function will remain the same. All other Rad Hard IC devices will also be converted to equivalent QML SMDs in approximately the same time frame. This conversion does not include Rad Hard Power MOSFET devices.
   See the "standardization" statement at the beginning of the Rad Hard Section for additional information.

See Section 1 for complete selection guide, page number reference, and file number listing.

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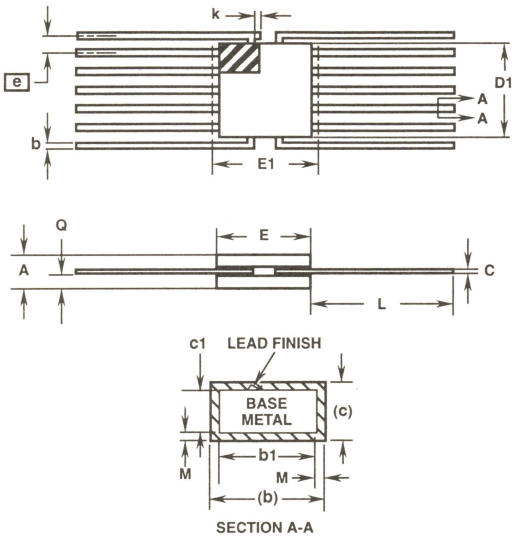
Ceramic Frit Seal Cerpack Packages (Cerpack)



A14.A

14 LEAD CERAMIC FRIT SEAL CERPACK PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.085	-	2.16	-
b	0.013	0.020	0.33	0.51	4
b1	0.013	0.017	0.33	0.43	-
c	0.004	0.009	0.10	0.23	4
c1	0.004	0.006	0.10	0.15	-
D1	0.238	0.260	6.05	6.60	-
E	0.238	0.260	6.05	6.60	-
E1	-	0.290	-	7.37	3
e	0.050 BSC		1.27 BSC		-
k	0.005	0.015	0.13	0.38	2
L	0.260	0.290	6.60	7.37	-
Q	0.026	0.045	0.66	1.14	6
M	-	0.0015	-	0.04	4
N	14		14		5

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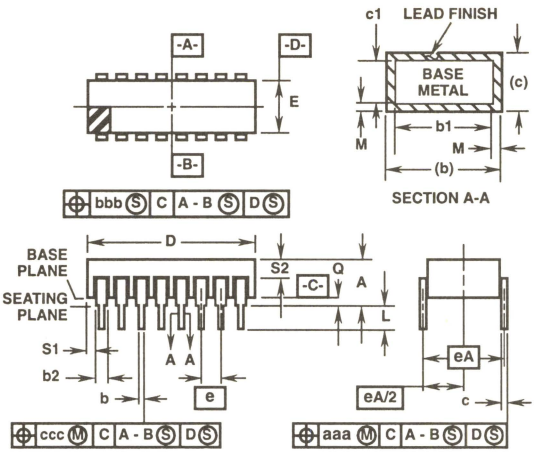
NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark. Alternately, a tab (dimension k) may be used to identify pin one.
2. If a pin one identification mark is used in addition to a tab, the limits of dimension k do not apply.
3. This dimension allows for off-center lid, meniscus, and glass overrun.
4. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thichness. The maximum limits of lead dimensions b and c or M shall be measured at the centriod of the finished lead surfaces when solder dip or tin plate lead finish is applied.
5. N is the maximum number of terminal positions.
6. Dimension Q shall be measured at the point of exit (beyond the meniscus) of the lead from the body. Dimension Q minimum shall be reduced by 0.0015 inch (0.038mm) maximum when solder dip lead finish A is applied.
7. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
8. Controlling dimension: INCH.

Ceramic Dual-In-Line Metal Seal Packages (SBDIP)



D8.3 MIL-STD-1835 CDIP2-T8 (D-4, CONFIGURATION C)
8 LEAD CERAMIC DUAL-IN-LINE METAL SEAL PACKAGE

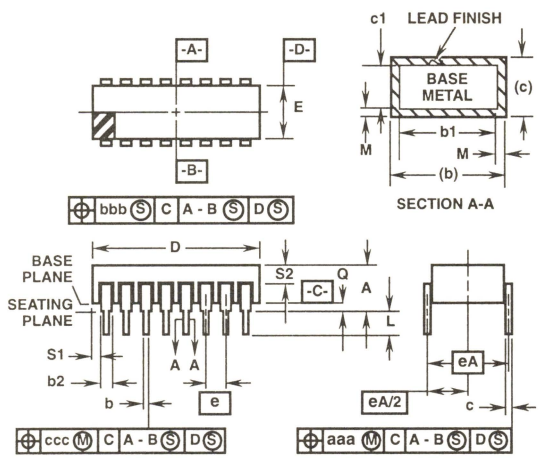
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.200	-	5.08	-
b	0.014	0.026	0.36	0.66	2
b1	0.014	0.023	0.36	0.58	3
b2	0.045	0.065	1.14	1.65	-
b3	0.023	0.045	0.58	1.14	4
c	0.008	0.018	0.20	0.46	2
c1	0.008	0.015	0.20	0.38	3
D	-	0.405	-	10.29	-
E	0.220	0.310	5.59	7.87	-
e	0.100 BSC		2.54 BSC		-
eA	0.300 BSC		7.62 BSC		-
eA/2	0.150 BSC		3.81 BSC		-
L	0.125	0.200	3.18	5.08	-
Q	0.015	0.060	0.38	1.52	5
S1	0.005	-	0.13	-	6
S2	0.005	-	0.13	-	7
α	90°	105°	90°	105°	-
aaa	-	0.015	-	0.38	-
bbb	-	0.030	-	0.76	-
ccc	-	0.010	-	0.25	-
M	-	0.0015	-	0.038	2
N	8		8		8

Rev. 0 4/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark.
2. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
3. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness.
4. Corner leads (1, N, N/2, and N/2+1) may be configured with a partial lead paddle. For this configuration dimension b3 replaces dimension b2.
5. Dimension Q shall be measured from the seating plane to the base plane.
6. Measure dimension S1 at all four corners.
7. Measure dimension S2 from the top of the ceramic body to the nearest metallization or lead.
8. N is the maximum number of terminal positions.
9. Braze fillets shall be concave.
10. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
11. Controlling dimension: INCH.

Ceramic Dual-In-Line Metal Seal Packages (SBDIP)



D14.3 MIL-STD-1835 CDIP2-T14 (D-1, CONFIGURATION C)
14 LEAD CERAMIC DUAL-IN-LINE METAL SEAL PACKAGE

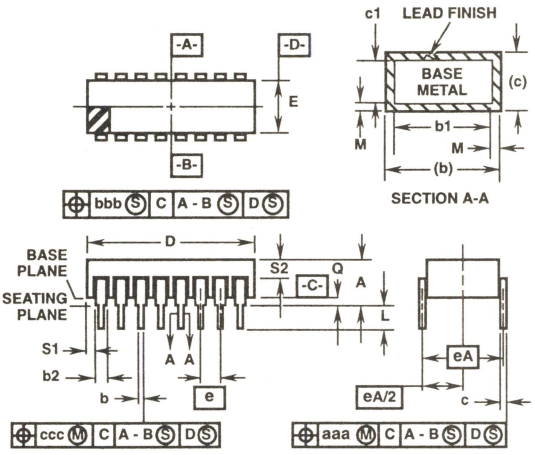
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.200	-	5.08	-
b	0.014	0.026	0.36	0.66	2
b1	0.014	0.023	0.36	0.58	3
b2	0.045	0.065	1.14	1.65	-
b3	0.023	0.045	0.58	1.14	4
c	0.008	0.018	0.20	0.46	2
c1	0.008	0.015	0.20	0.38	3
D	-	0.785	-	19.94	-
E	0.220	0.310	5.59	7.87	-
e	0.100 BSC		2.54 BSC		-
eA	0.300 BSC		7.62 BSC		-
eA/2	0.150 BSC		3.81 BSC		-
L	0.125	0.200	3.18	5.08	-
Q	0.015	0.060	0.38	1.52	5
S1	0.005	-	0.13	-	6
S2	0.005	-	0.13	-	7
α	90^o	105^o	90^o	105^o	-
aaa	-	0.015	-	0.38	-
bbb	-	0.030	-	0.76	-
ccc	-	0.010	-	0.25	-
M	-	0.0015	-	0.038	2
N	14		14		8

Rev. 0 4/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark.
2. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
3. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness.
4. Corner leads (1, N, N/2, and N/2+1) may be configured with a partial lead paddle. For this configuration dimension b3 replaces dimension b2.
5. Dimension Q shall be measured from the seating plane to the base plane.
6. Measure dimension S1 at all four corners.
7. Measure dimension S2 from the top of the ceramic body to the nearest metallization or lead.
8. N is the maximum number of terminal positions.
9. Braze fillets shall be concave.
10. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
11. Controlling dimension: INCH.

Ceramic Dual-In-Line Metal Seal Packages (SBDIP)



D16.3 MIL-STD-1835 CDIP2-T16 (D-2, CONFIGURATION C)
16 LEAD CERAMIC DUAL-IN-LINE METAL SEAL PACKAGE

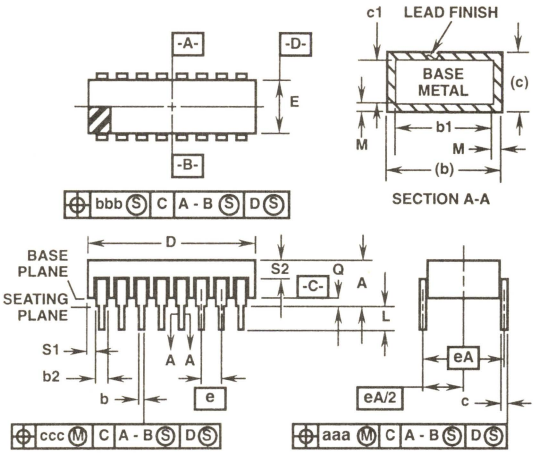
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.200	-	5.08	-
b	0.014	0.026	0.36	0.66	2
b1	0.014	0.023	0.36	0.58	3
b2	0.045	0.065	1.14	1.65	-
b3	0.023	0.045	0.58	1.14	4
c	0.008	0.018	0.20	0.46	2
c1	0.008	0.015	0.20	0.38	3
D	-	0.840	-	21.34	-
E	0.220	0.310	5.59	7.87	-
e	0.100 BSC		2.54 BSC		-
eA	0.300 BSC		7.62 BSC		-
eA/2	0.150 BSC		3.81 BSC		-
L	0.125	0.200	3.18	5.08	-
Q	0.015	0.060	0.38	1.52	5
S1	0.005	-	0.13	-	6
S2	0.005	-	0.13	-	7
α	90^{o}	105^{o}	90^{o}	105^{o}	-
aaa	-	0.015	-	0.38	-
bbb	-	0.030	-	0.76	-
ccc	-	0.010	-	0.25	-
M	-	0.0015	-	0.038	2
N	16		16		8

Rev. 0 4/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark.
2. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
3. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness.
4. Corner leads (1, N, N/2, and N/2+1) may be configured with a partial lead paddle. For this configuration dimension b3 replaces dimension b2.
5. Dimension Q shall be measured from the seating plane to the base plane.
6. Measure dimension S1 at all four corners.
7. Measure dimension S2 from the top of the ceramic body to the nearest metallization or lead.
8. N is the maximum number of terminal positions.
9. Braze fillets shall be concave.
10. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
11. Controlling dimension: INCH.

Ceramic Dual-In-Line Metal Seal Packages (SBDIP)



D18.3 MIL-STD-1835 CDIP2-T18 (D-6, CONFIGURATION C)
18 LEAD CERAMIC DUAL-IN-LINE METAL SEAL PACKAGE

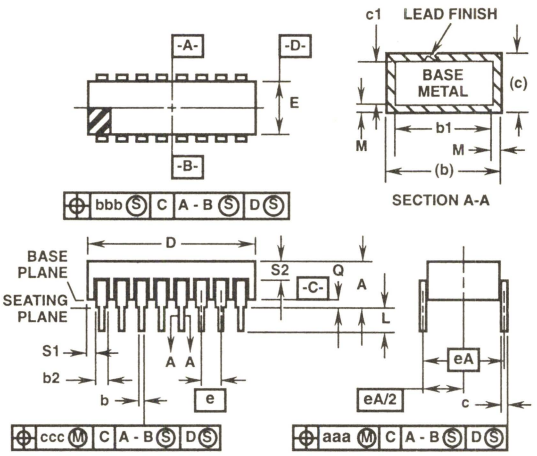
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.200	-	5.08	-
b	0.014	0.026	0.36	0.66	2
b1	0.014	0.023	0.36	0.58	3
b2	0.045	0.065	1.14	1.65	-
b3	0.023	0.045	0.58	1.14	4
c	0.008	0.018	0.20	0.46	2
c1	0.008	0.015	0.20	0.38	3
D	-	0.960	-	24.38	-
E	0.220	0.310	5.59	7.87	-
e	0.100 BSC		2.54 BSC		-
eA	0.300 BSC		7.62 BSC		-
eA/2	0.150 BSC		3.81 BSC		-
L	0.125	0.200	3.18	5.08	-
Q	0.015	0.070	0.38	1.78	5
S1	0.005	-	0.13	-	6
S2	0.005	-	0.13	-	7
α	90^o	105^o	90^o	105^o	-
aaa	-	0.015	-	0.38	-
bbb	-	0.030	-	0.76	-
ccc	-	0.010	-	0.25	-
M	-	0.0015	-	0.038	2
N	18		18		8

Rev. 0 5/18/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark.
2. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
3. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness.
4. Corner leads (1, N, N/2, and N/2+1) may be configured with a partial lead paddle. For this configuration dimension b3 replaces dimension b2.
5. Dimension Q shall be measured from the seating plane to the base plane.
6. Measure dimension S1 at all four corners.
7. Measure dimension S2 from the top of the ceramic body to the nearest metallization or lead.
8. N is the maximum number of terminal positions.
9. Braze fillets shall be concave.
10. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
11. Controlling dimension: INCH.

Ceramic Dual-In-Line Metal Seal Packages (SBDIP)



D20.3 MIL-STD-1835 CDIP2-T20 (D-8, CONFIGURATION C)
20 LEAD CERAMIC DUAL-IN-LINE METAL SEAL PACKAGE

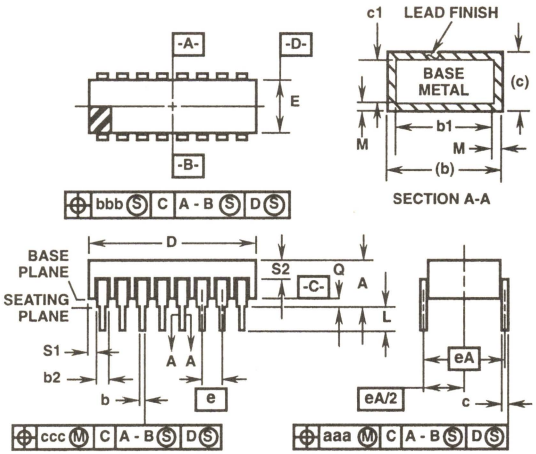
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.200	-	5.08	-
b	0.014	0.026	0.36	0.66	2
b1	0.014	0.023	0.36	0.58	3
b2	0.045	0.065	1.14	1.65	-
b3	0.023	0.045	0.58	1.14	4
c	0.008	0.018	0.20	0.46	2
c1	0.008	0.015	0.20	0.38	3
D	-	1.060	-	26.92	-
E	0.220	0.310	5.59	7.87	-
e	0.100 BSC		2.54 BSC		-
eA	0.300 BSC		7.62 BSC		-
eA/2	0.150 BSC		3.81 BSC		-
L	0.125	0.200	3.18	5.08	-
Q	0.015	0.070	0.38	1.78	5
S1	0.005	-	0.13	-	6
S2	0.005	-	0.13	-	7
α	90^{o}	105^{o}	90^{o}	105^{o}	-
aaa	-	0.015	-	0.38	-
bbb	-	0.030	-	0.76	-
ccc	-	0.010	-	0.25	-
M	-	0.0015	-	0.038	2
N	20		20		8

Rev. 0 4/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark.
2. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
3. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness.
4. Corner leads (1, N, N/2, and N/2+1) may be configured with a partial lead paddle. For this configuration dimension b3 replaces dimension b2.
5. Dimension Q shall be measured from the seating plane to the base plane.
6. Measure dimension S1 at all four corners.
7. Measure dimension S2 from the top of the ceramic body to the nearest metallization or lead.
8. N is the maximum number of terminal positions.
9. Braze fillets shall be concave.
10. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
11. Controlling dimension: INCH.

Ceramic Dual-In-Line Metal Seal Packages (SBDIP)



D22.4 MIL-STD-1835 CDIP2-T22 (D-7, CONFIGURATION C)
22 LEAD CERAMIC DUAL-IN-LINE METAL SEAL PACKAGE

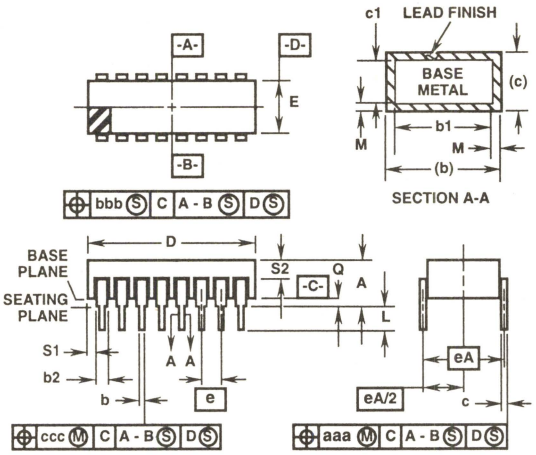
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.225	-	5.72	-
b	0.014	0.026	0.36	0.66	2
b1	0.014	0.023	0.36	0.58	3
b2	0.045	0.065	1.14	1.65	-
b3	0.023	0.045	0.58	1.14	4
c	0.008	0.018	0.20	0.46	2
c1	0.008	0.015	0.20	0.38	3
D	-	1.111	-	28.22	-
E	0.350	0.410	8.89	10.41	-
e	0.100 BSC		2.54 BSC		-
eA	0.400 BSC		10.16 BSC		-
eA/2	0.200 BSC		5.08 BSC		-
L	0.125	0.200	3.18	5.08	-
Q	0.015	0.070	0.38	1.78	5
S1	0.005	-	0.13	-	6
S2	0.005	-	0.13	-	7
α	90^o	105^o	90^o	105^o	-
aaa	-	0.015	-	0.38	-
bbb	-	0.030	-	0.76	-
ccc	-	0.010	-	0.25	-
M	-	0.0015	-	0.038	2
N	22		22		8

Rev. 0 4/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark.
2. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
3. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness.
4. Corner leads (1, N, N/2, and N/2+1) may be configured with a partial lead paddle. For this configuration dimension b3 replaces dimension b2.
5. Dimension Q shall be measured from the seating plane to the base plane.
6. Measure dimension S1 at all four corners.
7. Measure dimension S2 from the top of the ceramic body to the nearest metallization or lead.
8. N is the maximum number of terminal positions.
9. Braze fillets shall be concave.
10. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
11. Controlling dimension: INCH.

Ceramic Dual-In-Line Metal Seal Packages (SBDIP)



D22.4A

22 LEAD CERAMIC DUAL-IN-LINE METAL SEAL PACKAGE

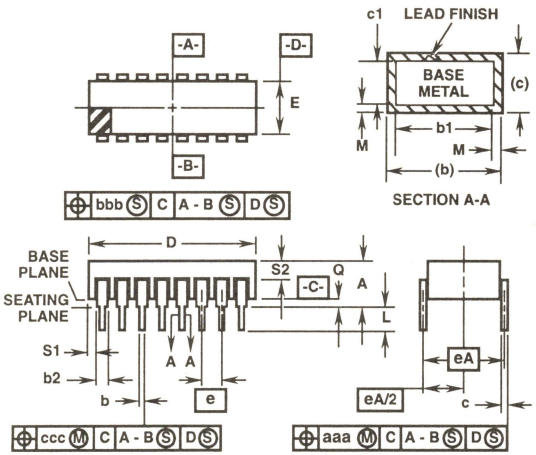
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.225	-	5.72	-
b	0.014	0.026	0.36	0.66	2
b1	0.014	0.023	0.36	0.58	3
b2	0.045	0.065	1.14	1.65	-
b3	0.023	0.045	0.58	1.14	4
c	0.008	0.018	0.20	0.46	2
c1	0.008	0.015	0.20	0.38	3
D	-	1.111	-	28.22	-
E	0.350	0.410	8.89	10.41	-
e	0.100 BSC		2.54 BSC		-
eA	0.400 BSC		10.16 BSC		-
eA/2	0.200 BSC		5.08 BSC		-
L	0.125	0.200	3.18	5.08	-
Q	0.015	0.070	0.38	1.78	5
S1	0.000	-	0.00	-	6
S2	0.005	-	0.13	-	7
α	90^o	105^o	90^o	105^o	-
aaa	-	0.015	-	0.38	-
bbb	-	0.030	-	0.76	-
ccc	-	0.010	-	0.25	-
M	-	0.0015	-	0.038	2
N	22		22		8

Rev. 0 6/20/95

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark.
2. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
3. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness.
4. Corner leads (1, N, N/2, and N/2+1) may be configured with a partial lead paddle. For this configuration dimension b3 replaces dimension b2.
5. Dimension Q shall be measured from the seating plane to the base plane.
6. Measure dimension S1 at all four corners.
7. Measure dimension S2 from the top of the ceramic body to the nearest metallization or lead.
8. N is the maximum number of terminal positions.
9. Braze fillets shall be concave.
10. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
11. Controlling dimension: INCH.

Ceramic Dual-In-Line Metal Seal Packages (SBDIP)



D24.6 MIL-STD-1835 CDIP2-T24 (D-3, CONFIGURATION C)
24 LEAD CERAMIC DUAL-IN-LINE METAL SEAL PACKAGE

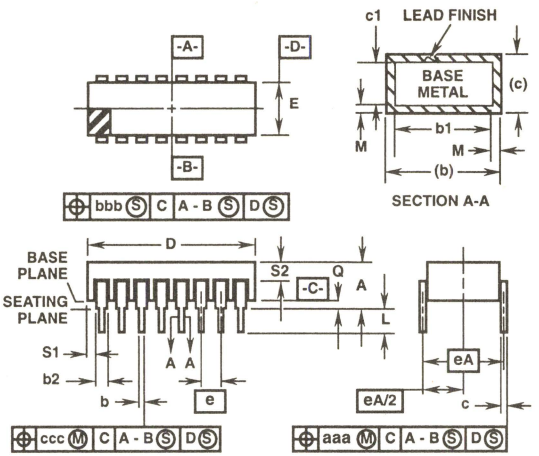
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.225	-	5.72	-
b	0.014	0.026	0.36	0.66	2
b1	0.014	0.023	0.36	0.58	3
b2	0.045	0.065	1.14	1.65	-
b3	0.023	0.045	0.58	1.14	4
c	0.008	0.018	0.20	0.46	2
c1	0.008	0.015	0.20	0.38	3
D	-	1.290	-	32.77	-
E	0.500	0.610	12.70	15.49	-
e	0.100 BSC		2.54 BSC		-
eA	0.600 BSC		15.24 BSC		-
eA/2	0.300 BSC		7.62 BSC		-
L	0.120	0.200	3.05	5.08	-
Q	0.015	0.075	0.38	1.91	5
S1	0.005	-	0.13	-	6
S2	0.005	-	0.13	-	7
α	90^o	105^o	90^o	105^o	-
aaa	-	0.015	-	0.38	-
bbb	-	0.030	-	0.76	-
ccc	-	0.010	-	0.25	-
M	-	0.0015	-	0.038	2
N	24		24		8

Rev. 0 4/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark.
2. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
3. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness.
4. Corner leads (1, N, N/2, and N/2+1) may be configured with a partial lead paddle. For this configuration dimension b3 replaces dimension b2.
5. Dimension Q shall be measured from the seating plane to the base plane.
6. Measure dimension S1 at all four corners.
7. Measure dimension S2 from the top of the ceramic body to the nearest metallization or lead.
8. N is the maximum number of terminal positions.
9. Braze fillets shall be concave.
10. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
11. Controlling dimension: INCH.

Ceramic Dual-In-Line Metal Seal Packages (SBDIP)



D28.6 MIL-STD-1835 CDIP2-T28 (D-10, CONFIGURATION C)
28 LEAD CERAMIC DUAL-IN-LINE METAL SEAL PACKAGE

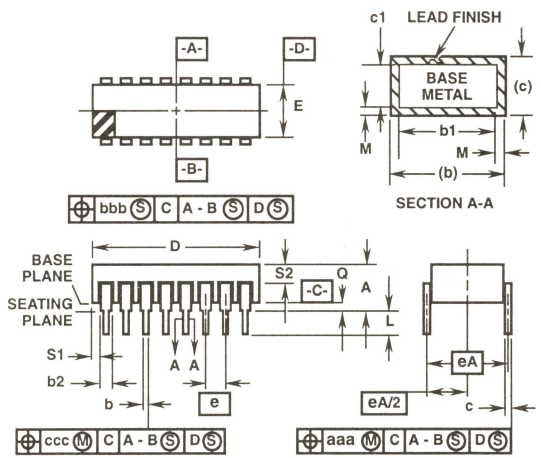
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.232	-	5.92	-
b	0.014	0.026	0.36	0.66	2
b1	0.014	0.023	0.36	0.58	3
b2	0.045	0.065	1.14	1.65	-
b3	0.023	0.045	0.58	1.14	4
c	0.008	0.018	0.20	0.46	2
c1	0.008	0.015	0.20	0.38	3
D	-	1.490	-	37.85	-
E	0.500	0.610	12.70	15.49	-
e	0.100 BSC		2.54 BSC		-
eA	0.600 BSC		15.24 BSC		-
eA/2	0.300 BSC		7.62 BSC		-
L	0.125	0.200	3.18	5.08	-
Q	0.015	0.060	0.38	1.52	5
S1	0.005	-	0.13	-	6
S2	0.005	-	0.13	-	7
α	90°	105°	90°	105°	-
aaa	-	0.015	-	0.38	-
bbb	-	0.030	-	0.76	-
ccc	-	0.010	-	0.25	-
M	-	0.0015	-	0.038	2
N	28		28		8

Rev. 0 5/18/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark.
2. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
3. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness.
4. Corner leads (1, N, N/2, and N/2+1) may be configured with a partial lead paddle. For this configuration dimension b3 replaces dimension b2.
5. Dimension Q shall be measured from the seating plane to the base plane.
6. Measure dimension S1 at all four corners.
7. Measure dimension S2 from the top of the ceramic body to the nearest metallization or lead.
8. N is the maximum number of terminal positions.
9. Braze fillets shall be concave.
10. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
11. Controlling dimension: INCH.

Ceramic Dual-In-Line Metal Seal Packages (SBDIP)



D40.6 MIL-STD-1835 CDIP2-T40 (D-5, CONFIGURATION C)
40 LEAD CERAMIC DUAL-IN-LINE METAL SEAL PACKAGE

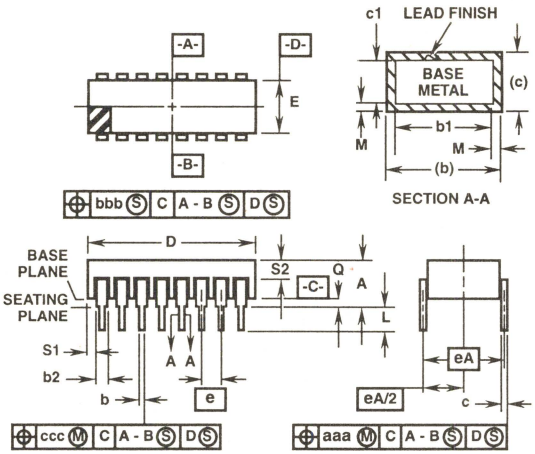
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.225	-	5.72	-
b	0.014	0.026	0.36	0.66	2
b1	0.014	0.023	0.36	0.58	3
b2	0.045	0.065	1.14	1.65	-
b3	0.023	0.045	0.58	1.14	4
c	0.008	0.018	0.20	0.46	2
c1	0.008	0.015	0.20	0.38	3
D	-	2.096	-	53.24	4
E	0.510	0.620	12.95	15.75	4
e	0.100 BSC		2.54 BSC		-
eA	0.600 BSC		15.24 BSC		-
eA/2	0.300 BSC		7.62 BSC		-
L	0.125	0.200	3.18	5.08	-
Q	0.015	0.070	0.38	1.78	5
S1	0.005	-	0.13	-	6
S2	0.005	-	0.13	-	7
α	90^o	105^o	90^o	105^o	-
aaa	-	0.015	-	0.38	-
bbb	-	0.030	-	0.76	-
ccc	-	0.010	-	0.25	-
M	-	0.0015	-	0.038	2
N	40		40		8

Rev. 0 4/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark.
2. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
3. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness.
4. Corner leads (1, N, N/2, and N/2+1) may be configured with a partial lead paddle. For this configuration dimension b3 replaces dimension b2.
5. Dimension Q shall be measured from the seating plane to the base plane.
6. Measure dimension S1 at all four corners.
7. Measure dimension S2 from the top of the ceramic body to the nearest metallization or lead.
8. N is the maximum number of terminal positions.
9. Braze fillets shall be concave.
10. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
11. Controlling dimension: INCH.

Ceramic Dual-In-Line Metal Seal Packages (SBDIP)



D42.6

42 LEAD CERAMIC DUAL-IN-LINE METAL SEAL PACKAGE

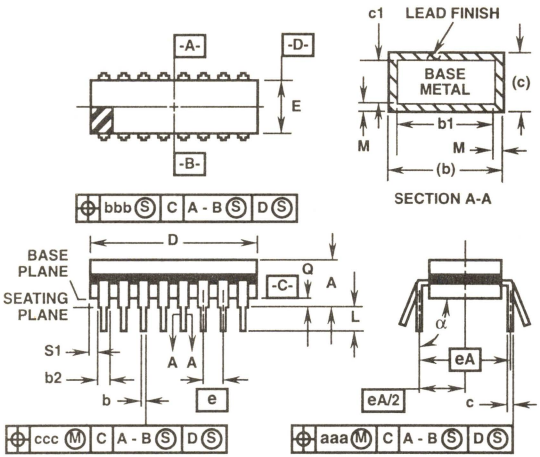
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.142	0.225	3.60	5.72	-
b	0.014	0.026	0.36	0.66	2
b1	0.014	0.022	0.36	0.56	3
b2	0.035	0.043	1.90	1.10	-
b3	-	-	-	-	4
c	0.009	0.015	0.23	0.38	2
c1	0.009	0.012	0.23	0.30	3
D	2.083	2.122	52.9	53.9	-
E	0.510	0.620	12.95	15.75	-
e	0.100 BSC		2.54 BSC		-
eA	0.600 BSC		15.24 BSC		-
eA/2	0.300 BSC		7.62 BSC		-
L	0.130	-	3.30	-	-
Q	0.039	-	1.00	-	5
S1	0.005	-	0.13	-	6
S2	0.005	-	0.13	-	7
α	90^o	105^o	90^o	105^o	-
aaa	-	0.015	-	0.38	-
bbb	-	0.030	-	0.76	-
ccc	-	0.010	-	0.25	-
M	-	0.0015	-	0.038	2
N	42		42		8

Rev. 0 4/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark.
2. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
3. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness.
4. Corner leads (1, N, N/2, and N/2+1) may be configured with a partial lead paddle. For this configuration dimension b3 replaces dimension b2.
5. Dimension Q shall be measured from the seating plane to the base plane.
6. Measure dimension S1 at all four corners.
7. Measure dimension S2 from the top of the ceramic body to the nearest metallization or lead.
8. N is the maximum number of terminal positions.
9. Braze fillets shall be concave.
10. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
11. Controlling dimension: INCH.

Ceramic Dual-In-Line Frit Seal Packages (CerDIP)



F8.3A MIL-STD-1835 GDIP1-T8 (D-4, CONFIGURATION A)
8 LEAD CERAMIC DUAL-IN-LINE FRIT SEAL PACKAGE

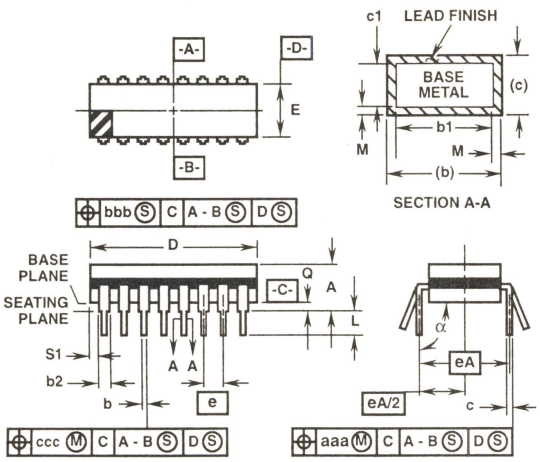
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.200	-	5.08	-
b	0.014	0.026	0.36	0.66	2
b1	0.014	0.023	0.36	0.58	3
b2	0.045	0.065	1.14	1.65	-
b3	0.023	0.045	0.58	1.14	4
c	0.008	0.018	0.20	0.46	2
c1	0.008	0.015	0.20	0.38	3
D	-	0.405	-	10.29	5
E	0.220	0.310	5.59	7.87	5
e	0.100 BSC		2.54 BSC		-
eA	0.300 BSC		7.62 BSC		-
eA/2	0.150 BSC		3.81 BSC		-
L	0.125	0.200	3.18	5.08	-
Q	0.015	0.060	0.38	1.52	6
S1	0.005	-	0.13	-	7
α	90°	105°	90°	105°	-
aaa	-	0.015	-	0.38	-
bbb	-	0.030	-	0.76	-
ccc	-	0.010	-	0.25	-
M	-	0.0015	-	0.038	2, 3
N	8		8		8

Rev. 0 4/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark.
2. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
3. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness.
4. Corner leads (1, N, N/2, and N/2+1) may be configured with a partial lead paddle. For this configuration dimension b3 replaces dimension b2.
5. This dimension allows for off-center lid, meniscus, and glass overrun.
6. Dimension Q shall be measured from the seating plane to the base plane.
7. Measure dimension S1 at all four corners.
8. N is the maximum number of terminal positions.
9. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
10. Controlling dimension: INCH.

Ceramic Dual-In-Line Frit Seal Packages (CerDIP)



F14.3 MIL-STD-1835 GDIP1-T14 (D-1, CONFIGURATION A)
14 LEAD CERAMIC DUAL-IN-LINE FRIT SEAL PACKAGE

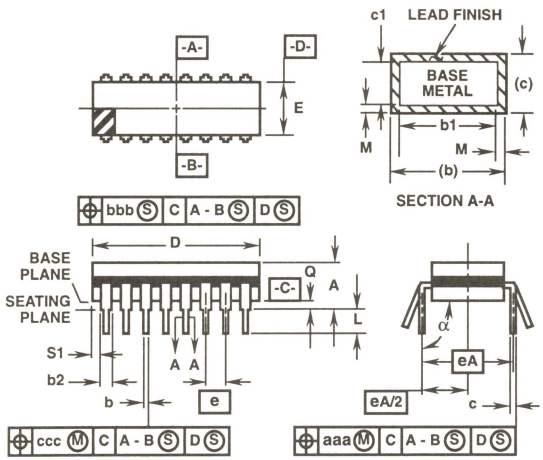
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.200	-	5.08	-
b	0.014	0.026	0.36	0.66	2
b1	0.014	0.023	0.36	0.58	3
b2	0.045	0.065	1.14	1.65	-
b3	0.023	0.045	0.58	1.14	4
c	0.008	0.018	0.20	0.46	2
c1	0.008	0.015	0.20	0.38	3
D	-	0.785	-	19.94	5
E	0.220	0.310	5.59	7.87	5
e	0.100 BSC		2.54 BSC		-
eA	0.300 BSC		7.62 BSC		-
eA/2	0.150 BSC		3.81 BSC		-
L	0.125	0.200	3.18	5.08	-
Q	0.015	0.060	0.38	1.52	6
S1	0.005	-	0.13	-	7
α	90°	105°	90°	105°	-
aaa	-	0.015	-	0.38	-
bbb	-	0.030	-	0.76	-
ccc	-	0.010	-	0.25	-
M	-	0.0015	-	0.038	2, 3
N	14		14		8

Rev. 0 4/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark.
2. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
3. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness.
4. Corner leads (1, N, N/2, and N/2+1) may be configured with a partial lead paddle. For this configuration dimension b3 replaces dimension b2.
5. This dimension allows for off-center lid, meniscus, and glass overrun.
6. Dimension Q shall be measured from the seating plane to the base plane.
7. Measure dimension S1 at all four corners.
8. N is the maximum number of terminal positions.
9. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
10. Controlling dimension: INCH.

Ceramic Dual-In-Line Frit Seal Packages (CerDIP)



F16.3 MIL-STD-1835 GDIP1-T16 (D-2, CONFIGURATION A)
16 LEAD CERAMIC DUAL-IN-LINE FRIT SEAL PACKAGE

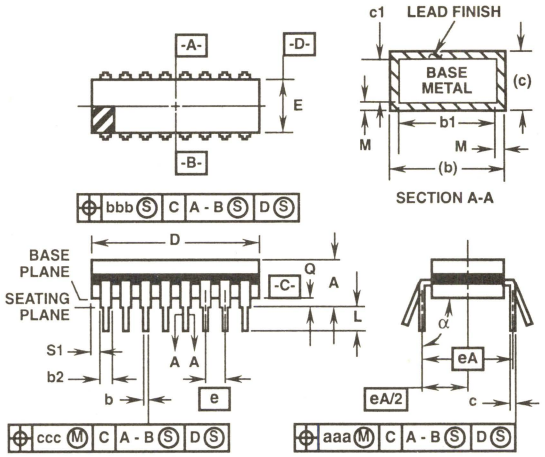
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.200	-	5.08	-
b	0.014	0.026	0.36	0.66	2
b1	0.014	0.023	0.36	0.58	3
b2	0.045	0.065	1.14	1.65	-
b3	0.023	0.045	0.58	1.14	4
c	0.008	0.018	0.20	0.46	2
c1	0.008	0.015	0.20	0.38	3
D	-	0.840	-	21.34	5
E	0.220	0.310	5.59	7.87	5
e	0.100 BSC		2.54 BSC		-
eA	0.300 BSC		7.62 BSC		-
eA/2	0.150 BSC		3.81 BSC		-
L	0.125	0.200	3.18	5.08	-
Q	0.015	0.060	0.38	1.52	6
S1	0.005	-	0.13	-	7
α	90°	105°	90°	105°	-
aaa	-	0.015	-	0.38	-
bbb	-	0.030	-	0.76	-
ccc	-	0.010	-	0.25	-
M	-	0.0015	-	0.038	2, 3
N	16		16		8

Rev. 0 4/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark.
2. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
3. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness.
4. Corner leads (1, N, N/2, and N/2+1) may be configured with a partial lead paddle. For this configuration dimension b3 replaces dimension b2.
5. This dimension allows for off-center lid, meniscus, and glass overrun.
6. Dimension Q shall be measured from the seating plane to the base plane.
7. Measure dimension S1 at all four corners.
8. N is the maximum number of terminal positions.
9. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
10. Controlling dimension: INCH.

Ceramic Dual-In-Line Frit Seal Packages (CerDIP)



F18.3 MIL-STD-1835 GDIP1-T18 (D-6, CONFIGURATION A)
18 LEAD CERAMIC DUAL-IN-LINE FRIT SEAL PACKAGE

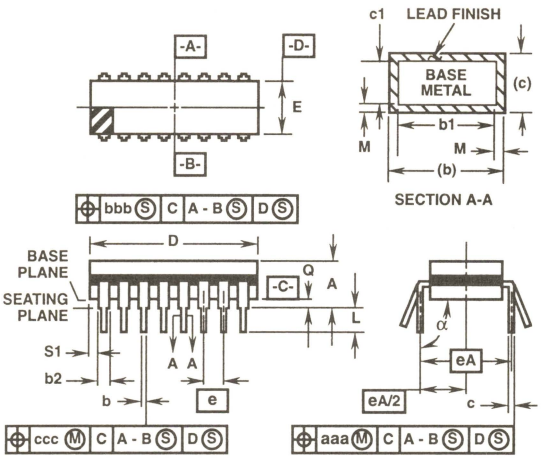
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.200	-	5.08	-
b	0.014	0.026	0.36	0.66	2
b1	0.014	0.023	0.36	0.58	3
b2	0.045	0.065	1.14	1.65	-
b3	0.023	0.045	0.58	1.14	4
c	0.008	0.018	0.20	0.46	2
c1	0.008	0.015	0.20	0.38	3
D	-	0.960	-	24.38	5
E	0.220	0.310	5.59	7.87	5
e	0.100 BSC		2.54 BSC		-
eA	0.300 BSC		7.62 BSC		-
eA/2	0.150 BSC		3.81 BSC		-
L	0.125	0.200	3.18	5.08	-
Q	0.015	0.070	0.38	1.78	6
S1	0.005	-	0.13	-	7
α	90°	105°	90°	105°	-
aaa	-	0.015	-	0.38	-
bbb	-	0.030	-	0.76	-
ccc	-	0.010	-	0.25	-
M	-	0.0015	-	0.038	2, 3
N	18		18		8

Rev. 0 4/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark.
2. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
3. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness.
4. Corner leads (1, N, N/2, and N/2+1) may be configured with a partial lead paddle. For this configuration dimension b3 replaces dimension b2.
5. This dimension allows for off-center lid, meniscus, and glass overrun.
6. Dimension Q shall be measured from the seating plane to the base plane.
7. Measure dimension S1 at all four corners.
8. N is the maximum number of terminal positions.
9. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
10. Controlling dimension: INCH.

Ceramic Dual-In-Line Frit Seal Packages (CerDIP)



F20.3 MIL-STD-1835 GDIP1-T20 (D-8, CONFIGURATION A)
20 LEAD CERAMIC DUAL-IN-LINE FRIT SEAL PACKAGE

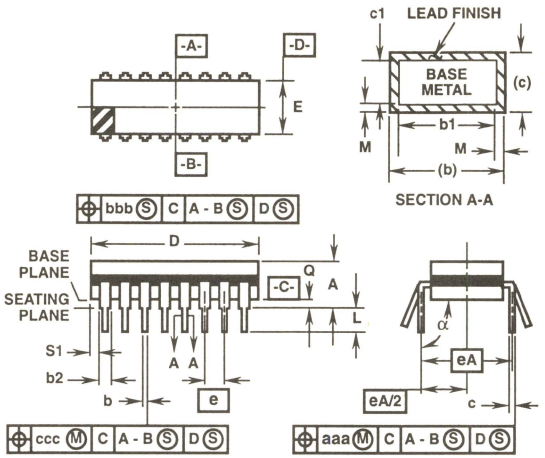
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.200	-	5.08	-
b	0.014	0.026	0.36	0.66	2
b1	0.014	0.023	0.36	0.58	3
b2	0.045	0.065	1.14	1.65	-
b3	0.023	0.045	0.58	1.14	4
c	0.008	0.018	0.20	0.46	2
c1	0.008	0.015	0.20	0.38	3
D	-	1.060	-	26.92	5
E	0.220	0.310	5.59	7.87	5
e	0.100 BSC		2.54 BSC		-
eA	0.300 BSC		7.62 BSC		-
eA/2	0.150 BSC		3.81 BSC		-
L	0.125	0.200	3.18	5.08	-
Q	0.015	0.070	0.38	1.78	6
S1	0.005	-	0.13	-	7
α	90°	105°	90°	105°	-
aaa	-	0.015	-	0.38	-
bbb	-	0.030	-	0.76	-
ccc	-	0.010	-	0.25	-
M	-	0.0015	-	0.038	2, 3
N	20		20		8

Rev. 0 4/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark.
2. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
3. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness.
4. Corner leads (1, N, N/2, and N/2+1) may be configured with a partial lead paddle. For this configuration dimension b3 replaces dimension b2.
5. This dimension allows for off-center lid, meniscus, and glass overrun.
6. Dimension Q shall be measured from the seating plane to the base plane.
7. Measure dimension S1 at all four corners.
8. N is the maximum number of terminal positions.
9. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
10. Controlling dimension: INCH.

Ceramic Dual-In-Line Frit Seal Packages (CerDIP)



F22.4 MIL-STD-1835 GDIP1-T22 (D-7, CONFIGURATION A)
22 LEAD CERAMIC DUAL-IN-LINE FRIT SEAL PACKAGE

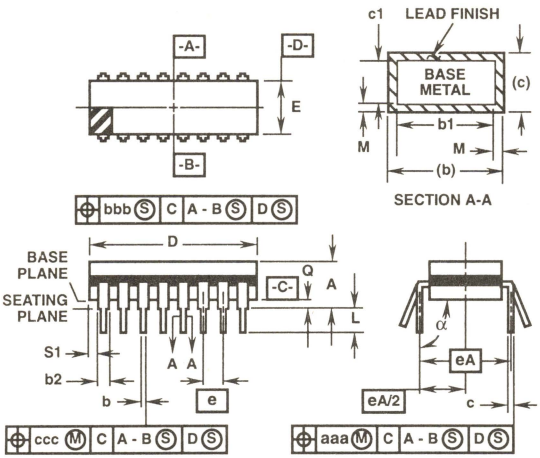
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.225	-	5.72	-
b	0.014	0.026	0.36	0.66	2
b1	0.014	0.023	0.36	0.58	3
b2	0.045	0.065	1.14	1.65	-
b3	0.023	0.045	0.58	1.14	4
c	0.008	0.018	0.20	0.46	2
c1	0.008	0.015	0.20	0.38	3
D	-	1.111	-	28.22	5
E	0.350	0.410	8.89	10.41	5
e	0.100 BSC		2.54 BSC		-
eA	0.400 BSC		10.16 BSC		-
eA/2	0.200 BSC		5.08 BSC		-
L	0.125	0.200	3.18	5.08	-
Q	0.015	0.070	0.38	1.78	6
S1	0.005	-	0.13	-	7
α	90°	105°	90°	105°	-
aaa	-	0.015	-	0.38	-
bbb	-	0.030	-	0.76	-
ccc	-	0.010	-	0.25	-
M	-	0.0015	-	0.038	2, 3
N	22		22		8

Rev. 0 6/13/95

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark.
2. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
3. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness.
4. Corner leads (1, N, N/2, and N/2+1) may be configured with a partial lead paddle. For this configuration dimension b3 replaces dimension b2.
5. This dimension allows for off-center lid, meniscus, and glass overrun.
6. Dimension Q shall be measured from the seating plane to the base plane.
7. Measure dimension S1 at all four corners.
8. N is the maximum number of terminal positions.
9. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
10. Controlling dimension: INCH.

Ceramic Dual-In-Line Frit Seal Packages (CerDIP)



F24.3 MIL-STD-1835 GDIP3-T24 (D-9, CONFIGURATION A)
24 LEAD CERAMIC DUAL-IN-LINE FRIT SEAL PACKAGE

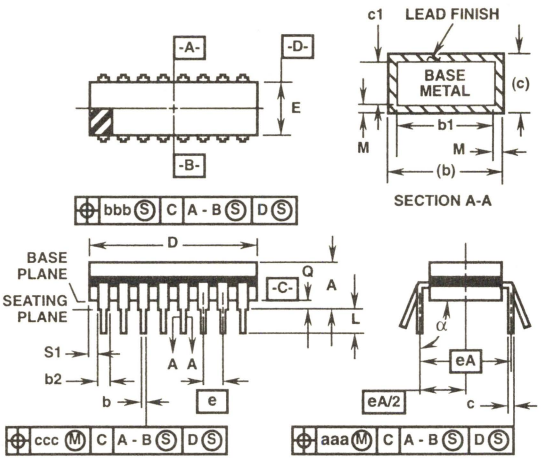
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.220	-	5.08	-
b	0.014	0.026	0.36	0.66	2
b1	0.014	0.023	0.36	0.58	3
b2	0.045	0.065	1.14	1.65	-
b3	0.023	0.045	0.58	1.14	4
c	0.008	0.018	0.20	0.46	2
c1	0.008	0.015	0.20	0.38	3
D	-	1.280	-	32.51	5
E	0.220	0.310	5.59	7.87	5
e	0.100 BSC		2.54 BSC		-
eA	0.300 BSC		7.62 BSC		-
eA/2	0.150 BSC		3.81 BSC		-
L	0.125	0.200	3.18	5.08	-
Q	0.015	0.060	0.38	1.52	6
S1	0.005	-	0.13	-	7
α	90°	105°	90°	105°	-
aaa	-	0.015	-	0.38	-
bbb	-	0.030	-	0.76	-
ccc	-	0.010	-	0.25	-
M	-	0.0015	-	0.038	2, 3
N	24		24		8

Rev. 0 4/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark.
2. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
3. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness.
4. Corner leads (1, N, N/2, and N/2+1) may be configured with a partial lead paddle. For this configuration dimension b3 replaces dimension b2.
5. This dimension allows for off-center lid, meniscus, and glass overrun.
6. Dimension Q shall be measured from the seating plane to the base plane.
7. Measure dimension S1 at all four corners.
8. N is the maximum number of terminal positions.
9. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
10. Controlling dimension: INCH.

Ceramic Dual-In-Line Frit Seal Packages (CerDIP)



F24.6 MIL-STD-1835 GDIP1-T24 (D-3, CONFIGURATION A)
24 LEAD CERAMIC DUAL-IN-LINE FRIT SEAL PACKAGE

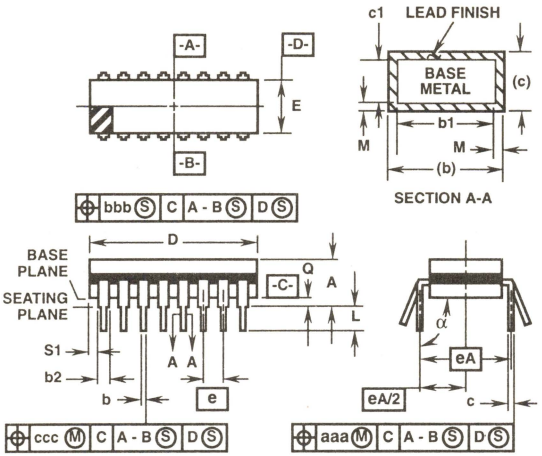
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.225	-	5.72	-
b	0.014	0.026	0.36	0.66	2
b1	0.014	0.023	0.36	0.58	3
b2	0.045	0.065	1.14	1.65	-
b3	0.023	0.045	0.58	1.14	4
c	0.008	0.018	0.20	0.46	2
c1	0.008	0.015	0.20	0.38	3
D	-	1.290	-	32.77	5
E	0.500	0.610	12.70	15.49	5
e	0.100 BSC		2.54 BSC		-
eA	0.600 BSC		15.24 BSC		-
eA/2	0.300 BSC		7.62 BSC		-
L	0.120	0.200	3.05	5.08	-
Q	0.015	0.075	0.38	1.91	6
S1	0.005	-	0.13	-	7
α	90°	105°	90°	105°	-
aaa	-	0.015	-	0.38	-
bbb	-	0.030	-	0.76	-
ccc	-	0.010	-	0.25	-
M	-	0.0015	-	0.038	2, 3
N	24		24		8

Rev. 0 4/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark.
2. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
3. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness.
4. Corner leads (1, N, N/2, and N/2+1) may be configured with a partial lead paddle. For this configuration dimension b3 replaces dimension b2.
5. This dimension allows for off-center lid, meniscus, and glass overrun.
6. Dimension Q shall be measured from the seating plane to the base plane.
7. Measure dimension S1 at all four corners.
8. N is the maximum number of terminal positions.
9. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
10. Controlling dimension: INCH.

Ceramic Dual-In-Line Frit Seal Packages (CerDIP)



F28.6 MIL-STD-1835 GDIP1-T28 (D-10, CONFIGURATION A)
28 LEAD CERAMIC DUAL-IN-LINE FRIT SEAL PACKAGE

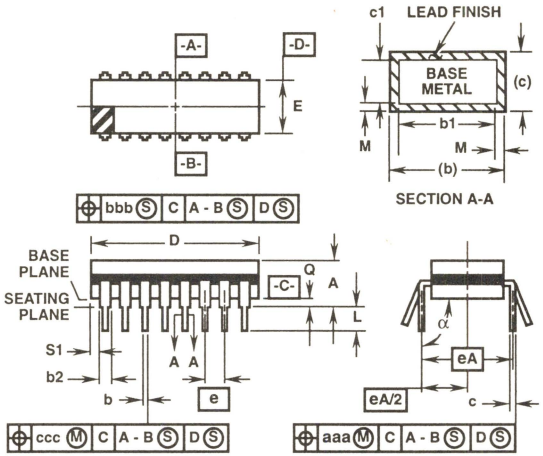
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.232	-	5.92	-
b	0.014	0.026	0.36	0.66	2
b1	0.014	0.023	0.36	0.58	3
b2	0.045	0.065	1.14	1.65	-
b3	0.023	0.045	0.58	1.14	4
c	0.008	0.018	0.20	0.46	2
c1	0.008	0.015	0.20	0.38	3
D	-	1.490	-	37.85	5
E	0.500	0.610	12.70	15.49	5
e	0.100 BSC		2.54 BSC		-
eA	0.600 BSC		15.24 BSC		-
eA/2	0.300 BSC		7.62 BSC		-
L	0.125	0.200	3.18	5.08	-
Q	0.015	0.060	0.38	1.52	6
S1	0.005	-	0.13	-	7
α	90°	105°	90°	105°	-
aaa	-	0.015	-	0.38	-
bbb	-	0.030	-	0.76	-
ccc	-	0.010	-	0.25	-
M	-	0.0015	-	0.038	2, 3
N	28		28		8

Rev. 0 4/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark.
2. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
3. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness.
4. Corner leads (1, N, N/2, and N/2+1) may be configured with a partial lead paddle. For this configuration dimension b3 replaces dimension b2.
5. This dimension allows for off-center lid, meniscus, and glass overrun.
6. Dimension Q shall be measured from the seating plane to the base plane.
7. Measure dimension S1 at all four corners.
8. N is the maximum number of terminal positions.
9. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
10. Controlling dimension: INCH.

Ceramic Dual-In-Line Frit Seal Packages (CerDIP)



F40.6 MIL-STD-1835 GDIP1-T40 (D-5, CONFIGURATION A)
40 LEAD CERAMIC DUAL-IN-LINE FRIT SEAL PACKAGE

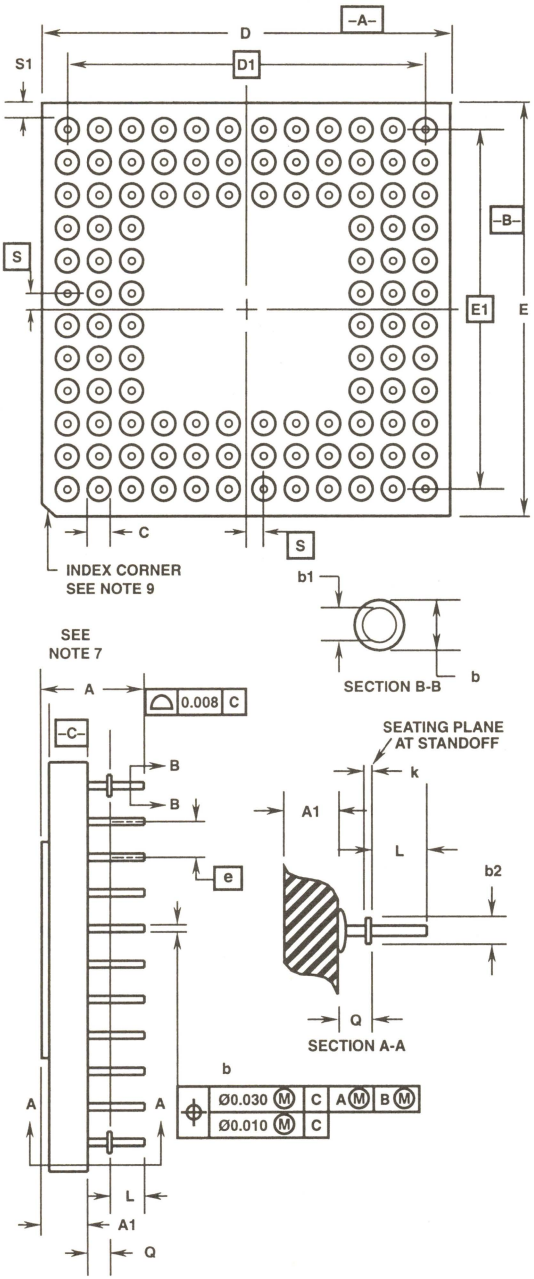
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.225	-	5.72	-
b	0.014	0.026	0.36	0.66	2
b1	0.014	0.023	0.36	0.58	3
b2	0.045	0.065	1.14	1.65	-
b3	0.023	0.045	0.58	1.14	4
c	0.008	0.018	0.20	0.46	2
c1	0.008	0.015	0.20	0.38	3
D	-	2.096	-	53.24	5
E	0.510	0.620	12.95	15.75	5
e	0.100 BSC		2.54 BSC		-
eA	0.600 BSC		15.24 BSC		-
eA/2	0.300 BSC		7.62 BSC		-
L	0.125	0.200	3.18	5.08	-
Q	0.015	0.070	0.38	1.78	6
S1	0.005	-	0.13	-	7
α	90°	105°	90°	105°	-
aaa	-	0.015	-	0.38	-
bbb	-	0.030	-	0.76	-
ccc	-	0.010	-	0.25	-
M	-	0.0015	-	0.038	2, 3
N	40		40		8

Rev. 0 4/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark.
2. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
3. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness.
4. Corner leads (1, N, N/2, and N/2+1) may be configured with a partial lead paddle. For this configuration dimension b3 replaces dimension b2.
5. This dimension allows for off-center lid, meniscus, and glass overrun.
6. Dimension Q shall be measured from the seating plane to the base plane.
7. Measure dimension S1 at all four corners.
8. N is the maximum number of terminal positions.
9. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
10. Controlling dimension: INCH.

Ceramic Pin Grid Array Packages (CPGA)



G48.A

48 LEAD CERAMIC PIN GRID ARRAY PACKAGE

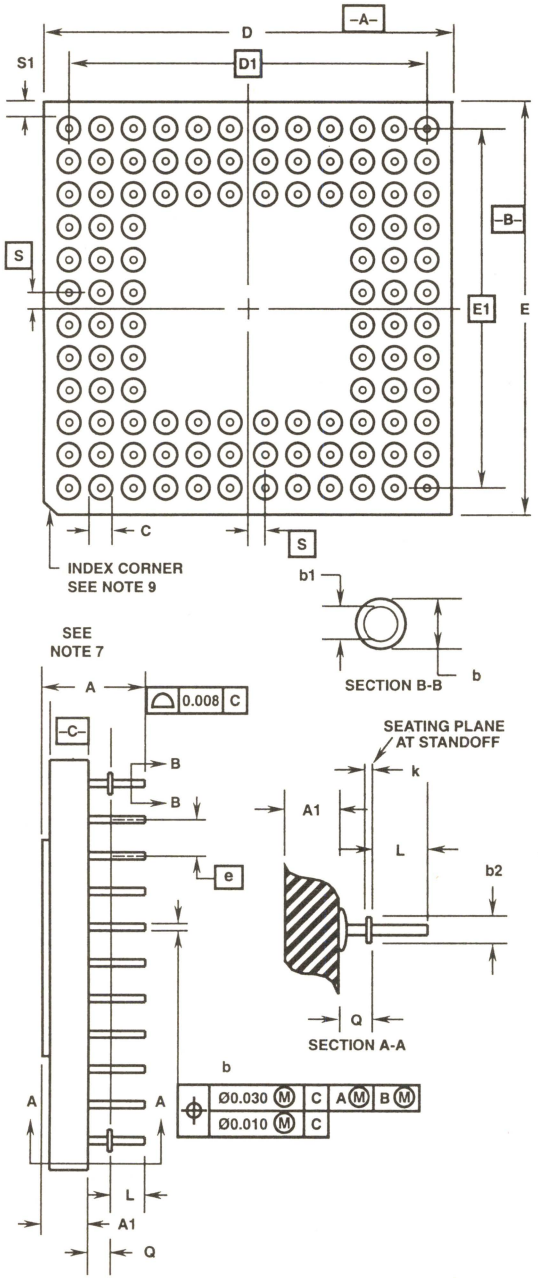
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	-	-	-	-
A1	0.080	0.120	2.03	3.05	3
b	0.016	0.0215	0.41	0.55	8
b1	0.016	0.020	0.41	0.51	-
b2	0.040	0.060	1.02	1.52	4
C	-	0.80	-	2.03	-
D	0.790	0.810	20.07	20.57	-
D1	0.700 BSC		17.78 BSC		-
E	0.790	0.810	20.07	20.57	-
E1	0.700 BSC		17.78 BSC		-
e	0.100 BSC		2.54 BSC		6
k	-	-	-	-	-
L	0.090	0.110	2.29	2.79	-
Q	0.40	0.060	1.02	1.52	5
S	0.050 BSC		1.27 BSC		10
S1	-	-	-	-	
M	8		8		1
N	-	64	-	64	2

Rev. 1 6/28/95

NOTES:

1. "M" represents the maximum pin matrix size.
2. "N" represents the maximum allowable number of pins. Number of pins and location of pins within the matrix is shown on the pinout listing in this data sheet.
3. Dimension "A1" includes the package body and Lid for both cavity-up and cavity-down configurations. This package is cavity up. Dimension "A1" does not include heatsinks or other attached features.
4. Standoffs are intrinsic and shall be located on the pin matrix diagonals. The seating plane is defined by the standoffs at dimensions Q.
5. Dimension "Q" applies to cavity-up configurations only.
6. All pins shall be on the 0.100 inch grid.
7. Datum C is the plane of pin to package interface for both cavity up and down configurations.
8. Pin diameter includes solder dip or custom finishes. Pin tips shall have a radius or chamfer.
9. Corner shape (chamfer, notch, radius, etc.) may vary from that shown on the drawing. The index corner shall be clearly unique.
10. Dimension "S" is measured with respect to datums A and B.
11. Dimensioning and tolerancing per ANSI Y14.5M-1982.
12. Controlling dimension: INCH.

Ceramic Pin Grid Array Packages (CPGA)



G68.A MIL-STD-1835 CMGA3-P68C (P-AC)
68 LEAD CERAMIC PIN GRID ARRAY PACKAGE

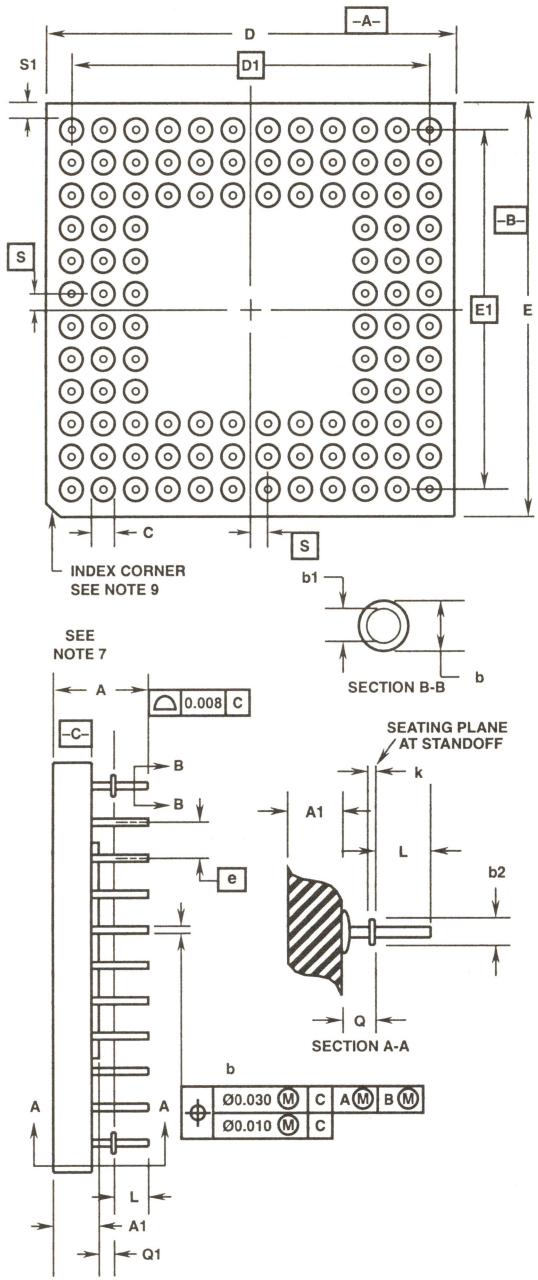
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.215	0.345	5.46	8.76	-
A1	0.070	0.145	1.78	3.68	3
b	0.016	0.0215	0.41	0.55	8
b1	0.016	0.020	0.41	0.51	-
b2	0.042	0.058	1.07	1.47	4
C	-	0.080	-	2.03	-
D	1.140	1.180	28.96	29.97	-
D1	1.000 BSC		25.4 BSC		-
E	1.140	1.180	28.96	29.97	-
E1	1.000 BSC		25.4 BSC		-
e	0.100 BSC		2.54 BSC		6
k	0.008 REF		0.20 REF		-
L	0.120	0.140	3.05	3.56	-
Q	0.040	0.060	1.02	1.52	5
S	0.000 BSC		0.00 BSC		10
S1	0.003	-	0.08	-	-
M	11		11		1
N	-	121	-	121	2

Rev. 1 6/28/95

NOTES:

1. "M" represents the maximum pin matrix size.
2. "N" represents the maximum allowable number of pins. Number of pins and location of pins within the matrix is shown on the pinout listing in this data sheet.
3. Dimension "A1" includes the package body and Lid for both cavity-up and cavity-down configurations. This package is cavity up. Dimension "A1" does not include heatsinks or other attached features.
4. Standoffs are intrinsic and shall be located on the pin matrix diagonals. The seating plane is defined by the standoffs at dimensions Q.
5. Dimension "Q" applies to cavity-up configurations only.
6. All pins shall be on the 0.100 inch grid.
7. Datum C is the plane of pin to package interface for both cavity up and down configurations.
8. Pin diameter includes solder dip or custom finishes. Pin tips shall have a radius or chamfer.
9. Corner shape (chamfer, notch, radius, etc.) may vary from that shown on the drawing. The index corner shall be clearly unique.
10. Dimension "S" is measured with respect to datums A and B.
11. Dimensioning and tolerancing per ANSI Y14.5M-1982.
12. Controlling dimension: INCH.

Ceramic Pin Grid Array Packages (CPGA)



G68.B MIL-STD-1835 CMGA3-P68D (P-AC)
68 LEAD CERAMIC PIN GRID ARRAY PACKAGE

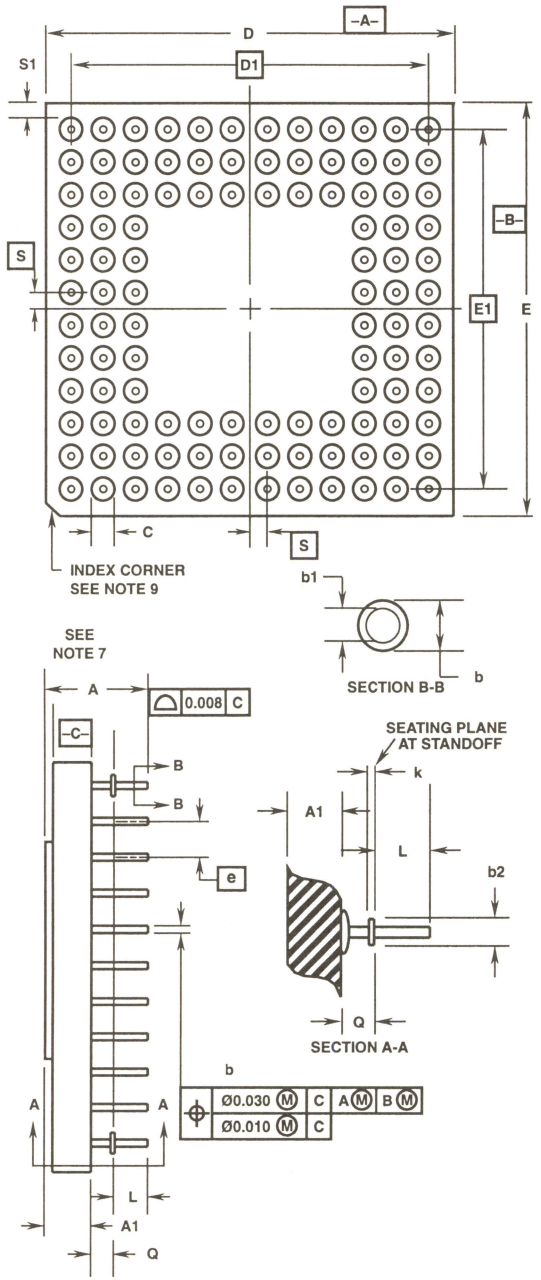
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.215	0.345	5.46	8.76	-
A1	0.070	0.145	1.78	3.68	3
b	0.016	0.0215	0.41	0.55	8
b1	0.016	0.020	0.41	0.51	-
b2	0.042	0.058	1.07	1.47	4
C	-	0.080	-	2.03	-
D	1.140	1.180	28.96	29.97	-
D1	1.000 BSC		25.4 BSC		-
E	1.140	1.180	28.96	29.97	-
E1	1.000 BSC		25.4 BSC		-
e	0.100 BSC		2.54 BSC		6
k	0.008 REF		0.20 REF		-
L	0.120	0.140	3.05	3.56	-
Q1	0.025	0.060	0.64	1.52	5
S	0.000 BSC		0.00 BSC		10
S1	0.003	-	0.08	-	-
M	11		11		1
N	-	121	-	121	2

Rev. 0 6/20/95

NOTES:

1. "M" represents the maximum pin matrix size.
2. "N" represents the maximum allowable number of pins. Number of pins and location of pins within the matrix is shown on the pinout listing in this data sheet.
3. Dimension "A1" includes the package body and Lid for both cavity-up and cavity-down configurations. This package is cavity down. Dimension "A1" does not include heatsinks or other attached features.
4. Standoffs are required and shall be located on the pin matrix diagonals. The seating plane is defined by the standoffs at dimension "Q1".
5. Dimension "Q1" applies to cavity-down configurations only.
6. All pins shall be on the 0.100 inch grid.
7. Datum C is the plane of pin to package interface for both cavity up and down configurations.
8. Pin diameter includes solder dip or custom finishes. Pin tips shall have a radius or chamfer.
9. Corner shape (chamfer, notch, radius, etc.) may vary from that shown on the drawing. The index corner shall be clearly unique.
10. Dimension "S" is measured with respect to datums A and B.
11. Dimensioning and tolerancing per ANSI Y14.5M-1982.
12. Controlling dimension: INCH.

Ceramic Pin Grid Array Packages (CPGA)



G84.A MIL-STD-1835 CMGA3-P84C (P-AC)
84 LEAD CERAMIC PIN GRID ARRAY PACKAGE

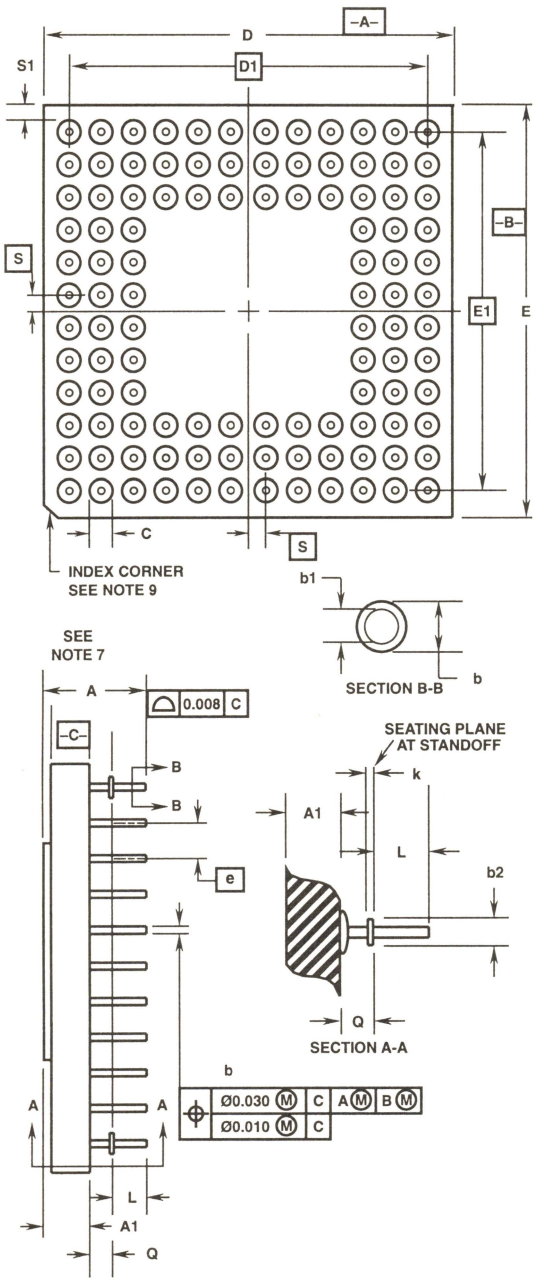
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.215	0.345	5.46	8.76	-
A1	0.070	0.145	1.78	3.68	3
b	0.016	0.0215	0.41	0.55	8
b1	0.016	0.020	0.41	0.51	-
b2	0.042	0.058	1.07	1.47	4
C	-	0.080	-	2.03	-
D	1.140	1.180	28.96	29.97	-
D1	1.000 BSC		25.4 BSC		-
E	1.140	1.180	28.96	29.97	-
E1	1.000 BSC		25.4 BSC		-
e	0.100 BSC		2.54 BSC		6
k	0.008 REF		0.20 REF		-
L	0.120	0.140	3.05	3.56	-
Q	0.040	0.060	1.02	1.52	5
S	0.000 BSC		0.00 BSC		10
S1	0.003	-	0.08	-	-
M	11		11		1
N	-	121	-	121	2

Rev. 1 6/28/95

NOTES:

1. "M" represents the maximum pin matrix size.
2. "N" represents the maximum allowable number of pins. Number of pins and location of pins within the matrix is shown on the pinout listing in this data sheet.
3. Dimension "A1" includes the package body and Lid for both cavity-up and cavity-down configurations. This package is cavity up. Dimension "A1" does not include heatsinks or other attached features.
4. Standoffs are intrinsic and shall be located on the pin matrix diagonals. The seating plane is defined by the standoffs at dimensions Q.
5. Dimension "Q" applies to cavity-up configurations only.
6. All pins shall be on the 0.100 inch grid.
7. Datum C is the plane of pin to package interface for both cavity up and down configurations.
8. Pin diameter includes solder dip or custom finishes. Pin tips shall have a radius or chamfer.
9. Corner shape (chamfer, notch, radius, etc.) may vary from that shown on the drawing. The index corner shall be clearly unique.
10. Dimension "S" is measured with respect to datums A and B.
11. Dimensioning and tolerancing per ANSI Y14.5M-1982.
12. Controlling dimension: INCH.

Ceramic Pin Grid Array Packages (CPGA)



G85.A MIL-STD-1835 CMGA3-P85C (P-AC)
85 LEAD CERAMIC PIN GRID ARRAY PACKAGE

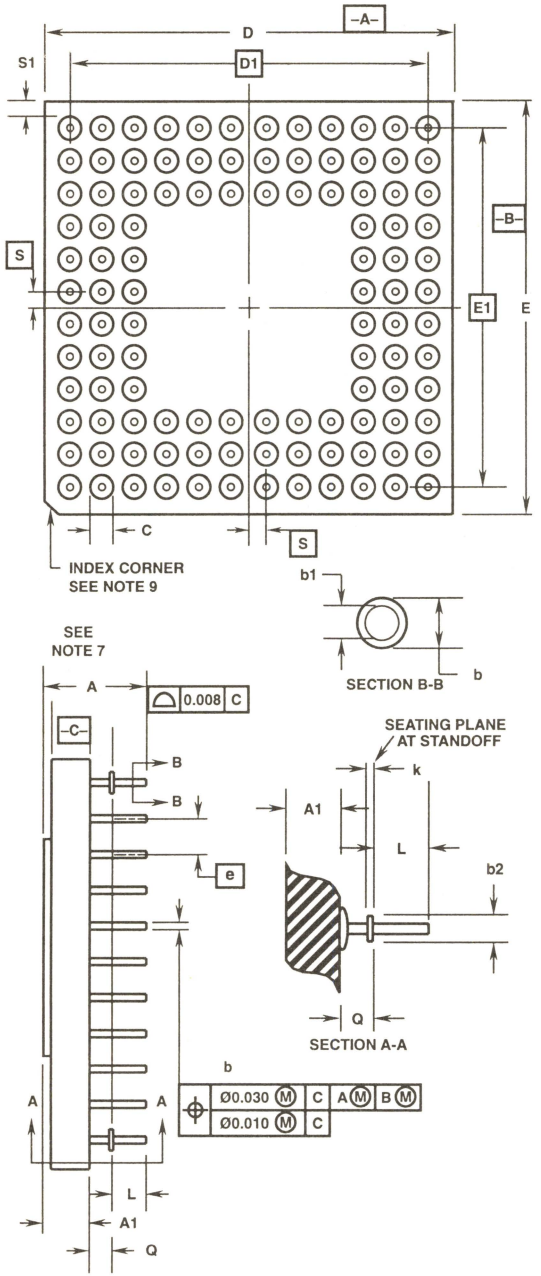
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.215	0.345	5.46	8.76	-
A1	0.070	0.145	1.78	3.68	3
b	0.016	0.0215	0.41	0.55	8
b1	0.016	0.020	0.41	0.51	-
b2	0.042	0.058	1.07	1.47	4
C	-	0.080	-	2.03	-
D	1.140	1.180	28.96	29.97	-
D1	1.000 BSC		25.4 BSC		-
E	1.140	1.180	28.96	29.97	-
E1	1.000 BSC		25.4 BSC		-
e	0.100 BSC		2.54 BSC		6
k	0.008 REF		0.20 REF		-
L	0.120	0.140	3.05	3.56	-
Q	0.040	0.060	1.02	1.52	5
S	0.000 BSC		0.00 BSC		10
S1	0.003	-	0.08	-	-
M	11		11		1
N	-	121	-	121	2

Rev. 1 6/21/95

NOTES:

1. "M" represents the maximum pin matrix size.
2. "N" represents the maximum allowable number of pins. Number of pins and location of pins within the matrix is shown on the pinout listing in this data sheet.
3. Dimension "A1" includes the package body and Lid for both cavity-up and cavity-down configurations. This package is cavity up. Dimension "A1" does not include heatsinks or other attached features.
4. Standoffs are intrinsic and shall be located on the pin matrix diagonals. The seating plane is defined by the standoffs at dimensions Q.
5. Dimension "Q" applies to cavity-up configurations only.
6. All pins shall be on the 0.100 inch grid.
7. Datum C is the plane of pin to package interface for both cavity up and down configurations.
8. Pin diameter includes solder dip or custom finishes. Pin tips shall have a radius or chamfer.
9. Corner shape (chamfer, notch, radius, etc.) may vary from that shown on the drawing. The index corner shall be clearly unique.
10. Dimension "S" is measured with respect to datums A and B.
11. Dimensioning and tolerancing per ANSI Y14.5M-1982.
12. Controlling dimension: INCH.

Ceramic Pin Grid Array Packages (CPGA)



G145.A MIL-STD-1835 CMGA7-P145C (P-AG)
145 LEAD CERAMIC PIN GRID ARRAY PACKAGE

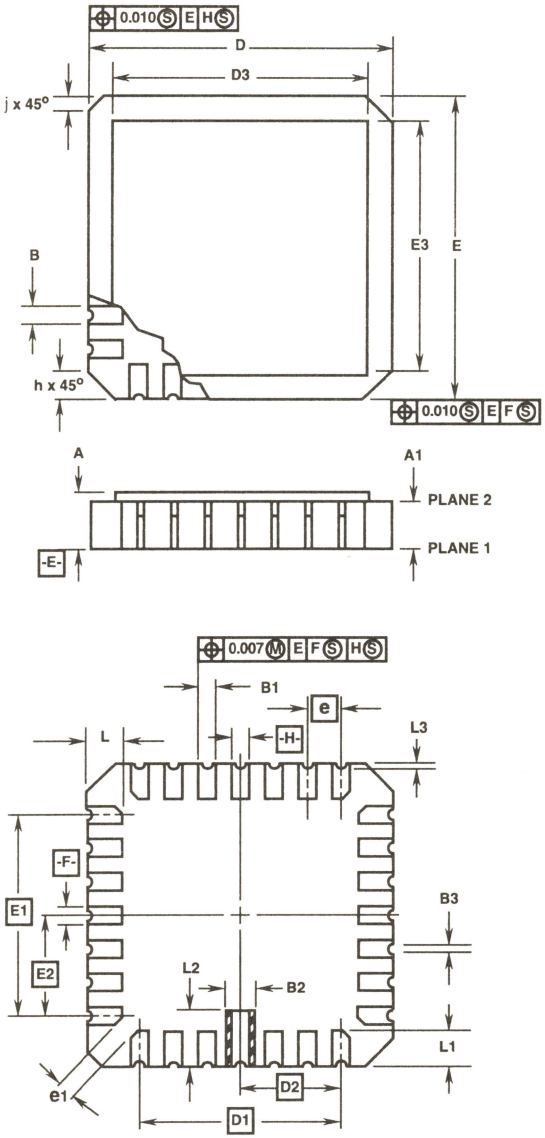
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.215	0.345	5.46	8.76	-
A1	0.070	0.145	1.78	3.68	3
b	0.016	0.0215	0.41	0.55	8
b1	0.016	0.020	0.41	0.51	-
b2	0.042	0.058	1.07	1.47	4
C	-	0.080	-	2.03	-
D	1.540	1.590	39.12	40.38	-
D1	1.400 BSC		35.56 BSC		-
E	1.540	1.590	39.12	40.38	-
E1	1.400 BSC		35.56 BSC		-
e	0.100 BSC		2.54 BSC		6
k	0.008 REF		0.20 REF		-
L	0.120	0.140	3.05	3.56	-
Q	0.040	0.060	1.02	1.52	5
S	0.000 BSC		0.00 BSC		10
S1	0.003	-	0.08	-	-
M	15		15		1
N	-	225	-	225	2

Rev. 1 6/28/95

NOTES:

1. "M" represents the maximum pin matrix size.
2. "N" represents the maximum allowable number of pins. Number of pins and location of pins within the matrix is shown on the pinout listing in this data sheet.
3. Dimension "A1" includes the package body and Lid for both cavity-up and cavity-down configurations. This package is cavity up. Dimension "A1" does not include heatsinks or other attached features.
4. Standoffs are intrinsic and shall be located on the pin matrix diagonals. The seating plane is defined by the standoffs at dimensions Q.
5. Dimension "Q" applies to cavity-up configurations only.
6. All pins shall be on the 0.100 inch grid.
7. Datum C is the plane of pin to package interface for both cavity up and down configurations.
8. Pin diameter includes solder dip or custom finishes. Pin tips shall have a radius or chamfer.
9. Corner shape (chamfer, notch, radius, etc.) may vary from that shown on the drawing. The index corner shall be clearly unique.
10. Dimension "S" is measured with respect to datums A and B.
11. Dimensioning and tolerancing per ANSI Y14.5M-1982.
12. Controlling dimension: INCH.

Ceramic Leadless Chip Carrier Packages (CLCC)



J18.A

18 PAD CERAMIC LEADLESS CHIP CARRIER PACKAGE

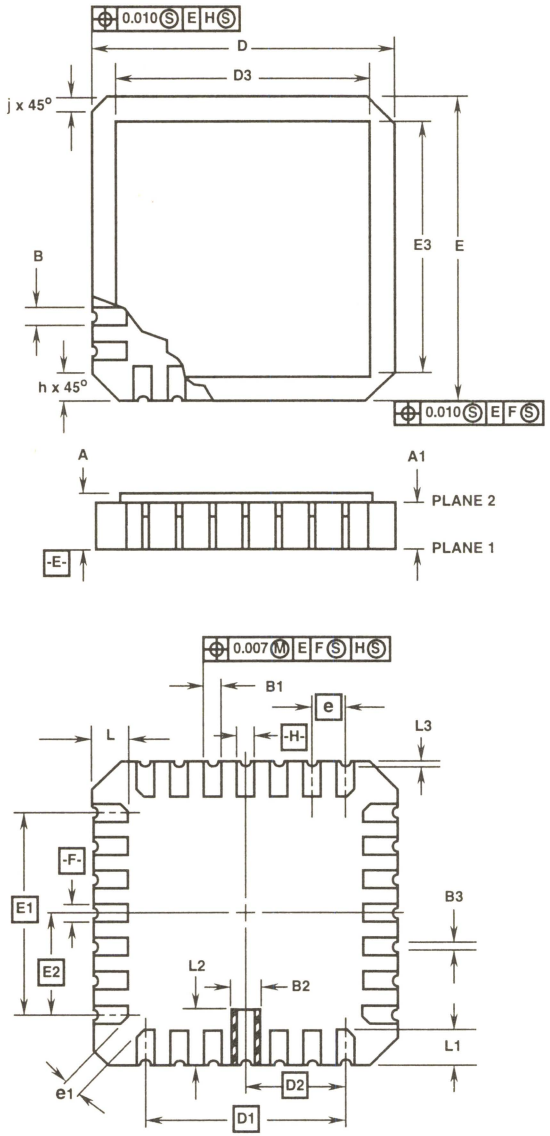
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.054	0.075	1.37	1.91	6, 7
A1	0.044	0.063	1.12	1.60	-
B	-	-	-	-	-
B1	0.020	0.030	0.51	0.76	2, 4
B2	-	-	-	-	-
B3	0.006	0.022	0.15	0.56	-
D	0.340	0.355	8.64	9.02	-
D1	0.150 BSC		3.81 BSC		-
D2	0.075 BSC		1.91 BSC		-
D3	0.320	0.330	8.13	8.38	1, 2
E	0.410	0.425	10.41	10.80	-
E1	0.200 BSC		5.08 BSC		-
E2	0.100 BSC		2.54 BSC		-
E3	0.390	0.400	9.91	10.16	2
e	0.050 BSC		1.27 BSC		-
e1	0.015	-	0.38	-	2
h	0.012R REF		0.30R REF		5
j	0.012R REF		0.30R REF		5
L	0.037	0.052	0.94	1.32	-
L1	0.037	0.052	0.94	1.32	-
L2	-	-	-	-	-
L3	0.003	0.015	0.08	0.38	-
ND	4		4		3
NE	5		5		3
N	18		18		3

Rev. 0 5/18/94

NOTES:

1. Metallized castellations shall be connected to plane 1 terminals and extend toward plane 2 across at least two layers of ceramic or completely across all of the ceramic layers to make electrical connection with the optional plane 2 terminals.
2. Unless otherwise specified, a minimum clearance of 0.015 inch (0.38mm) shall be maintained between all metallized features (e.g., lid, castellations, terminals, thermal pads, etc.)
3. Symbol "N" is the maximum number of terminals. Symbols "ND" and "NE" are the number of terminals along the sides of length "D" and "E", respectively.
4. The required plane 1 terminals and optional plane 2 terminals (if used) shall be electrically connected.
5. The corner shape (square, notch, radius, etc.) may vary at the manufacturer's option, from that shown on the drawing.
6. Chip carriers shall be constructed of a minimum of two ceramic layers.
7. Dimension "A" controls the overall package thickness. The maximum "A" dimension is package height before being solder dipped.
8. Dimensioning and tolerancing per ANSI Y14.5M-1982.
9. Controlling dimension: INCH.

Ceramic Leadless Chip Carrier Packages (CLCC)



J18.B

18 PAD CERAMIC LEADLESS CHIP CARRIER PACKAGE

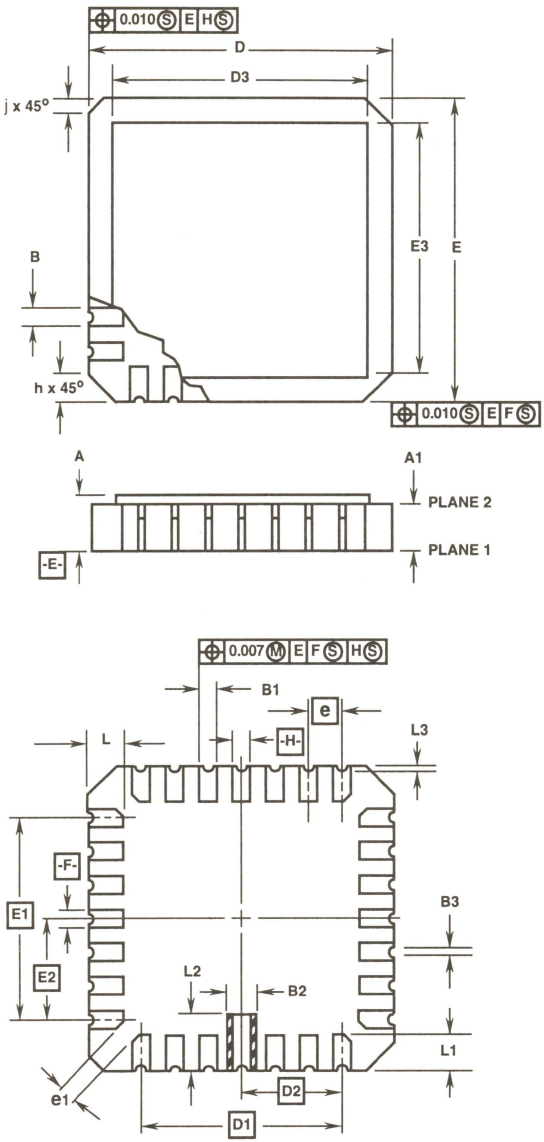
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.054	0.075	1.37	1.91	6, 7
A1	0.044	0.063	1.12	1.60	-
B	-	-	-	-	-
B1	0.020	0.030	0.51	0.76	2, 4
B2	-	-	-	-	-
B3	0.006	0.022	0.15	0.56	-
D	0.280	0.305	7.11	7.75	-
D1	0.150 BSC		3.81 BSC		-
D2	0.075 BSC		1.91 BSC		-
D3	-	0.305	-	7.75	1, 2
E	0.345	0.365	8.76	9.27	-
E1	0.200 BSC		5.08 BSC		-
E2	0.100 BSC		2.54 BSC		-
E3	-	0.365	-	9.27	2
e	0.050 BSC		1.27 BSC		-
e1	0.015	-	0.38	-	2
h	0.012R REF		0.30R REF		5
j	0.012R REF		0.30R REF		5
L	0.040	0.050	1.02	1.27	-
L1	0.040	0.050	1.02	1.27	-
L2	0.090	0.110	2.29	2.79	-
L3	0.003	0.015	0.08	0.38	-
ND	4		4		3
NE	5		5		3
N	18		18		3

Rev. 0 6/20/95

NOTES:

1. Metallized castellations shall be connected to plane 1 terminals and extend toward plane 2 across at least two layers of ceramic or completely across all of the ceramic layers to make electrical connection with the optional plane 2 terminals.
2. Unless otherwise specified, a minimum clearance of 0.015 inch (0.38mm) shall be maintained between all metallized features (e.g., lid, castellations, terminals, thermal pads, etc.)
3. Symbol "N" is the maximum number of terminals. Symbols "ND" and "NE" are the number of terminals along the sides of length "D" and "E", respectively.
4. The required plane 1 terminals and optional plane 2 terminals (if used) shall be electrically connected.
5. The corner shape (square, notch, radius, etc.) may vary at the manufacturer's option, from that shown on the drawing.
6. Chip carriers shall be constructed of a minimum of two ceramic layers.
7. Dimension "A" controls the overall package thickness. The maximum "A" dimension is package height before being solder dipped.
8. Dimensioning and tolerancing per ANSI Y14.5M-1982.
9. Controlling dimension: INCH.

Ceramic Leadless Chip Carrier Packages (CLCC)



J20.A MIL-STD-1835 CQCC1-N20 (C-2)
20 PAD CERAMIC LEADLESS CHIP CARRIER PACKAGE

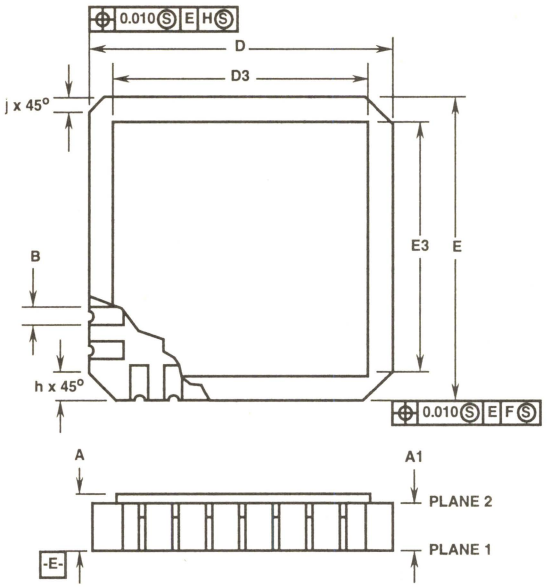
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.060	0.100	1.52	2.54	6, 7
A1	0.050	0.088	1.27	2.23	-
B	-	-	-	-	-
B1	0.022	0.028	0.56	0.71	2, 4
B2	0.072 REF		1.83 REF		-
B3	0.006	0.022	0.15	0.56	-
D	0.342	0.358	8.69	9.09	-
D1	0.200 BSC		5.08 BSC		-
D2	0.100 BSC		2.54 BSC		-
D3	-	0.358	-	9.09	2
E	0.342	0.358	8.69	9.09	-
E1	0.200 BSC		5.08 BSC		-
E2	0.100 BSC		2.54 BSC		-
E3	-	0.358	-	9.09	2
e	0.050 BSC		1.27 BSC		-
e1	0.015	-	0.38	-	2
h	0.040 REF		1.02 REF		5
j	0.020 REF		0.51 REF		5
L	0.045	0.055	1.14	1.40	-
L1	0.045	0.055	1.14	1.40	-
L2	0.075	0.095	1.91	2.41	-
L3	0.003	0.015	0.08	0.38	-
ND	5		5		3
NE	5		5		3
N	20		20		3

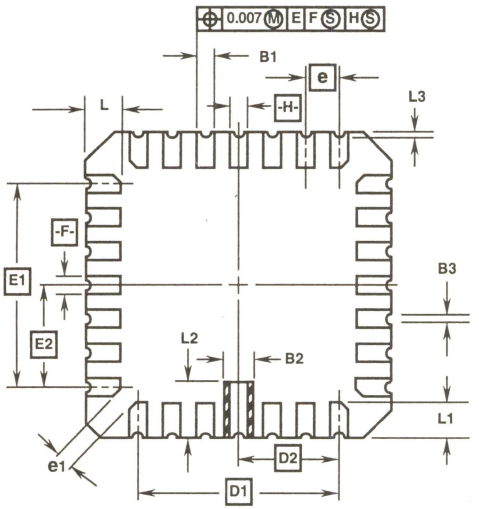
Rev. 0 5/18/94

NOTES:

1. Metallized castellations shall be connected to plane 1 terminals and extend toward plane 2 across at least two layers of ceramic or completely across all of the ceramic layers to make electrical connection with the optional plane 2 terminals.
2. Unless otherwise specified, a minimum clearance of 0.015 inch (0.38mm) shall be maintained between all metallized features (e.g., lid, castellations, terminals, thermal pads, etc.)
3. Symbol "N" is the maximum number of terminals. Symbols "ND" and "NE" are the number of terminals along the sides of length "D" and "E", respectively.
4. The required plane 1 terminals and optional plane 2 terminals (if used) shall be electrically connected.
5. The corner shape (square, notch, radius, etc.) may vary at the manufacturer's option, from that shown on the drawing.
6. Chip carriers shall be constructed of a minimum of two ceramic layers.
7. Dimension "A" controls the overall package thickness. The maximum "A" dimension is package height before being solder dipped.
8. Dimensioning and tolerancing per ANSI Y14.5M-1982.
9. Controlling dimension: INCH.

Ceramic Leadless Chip Carrier Packages (CLCC)





J20.B

20 PAD CERAMIC LEADLESS CHIP CARRIER PACKAGE

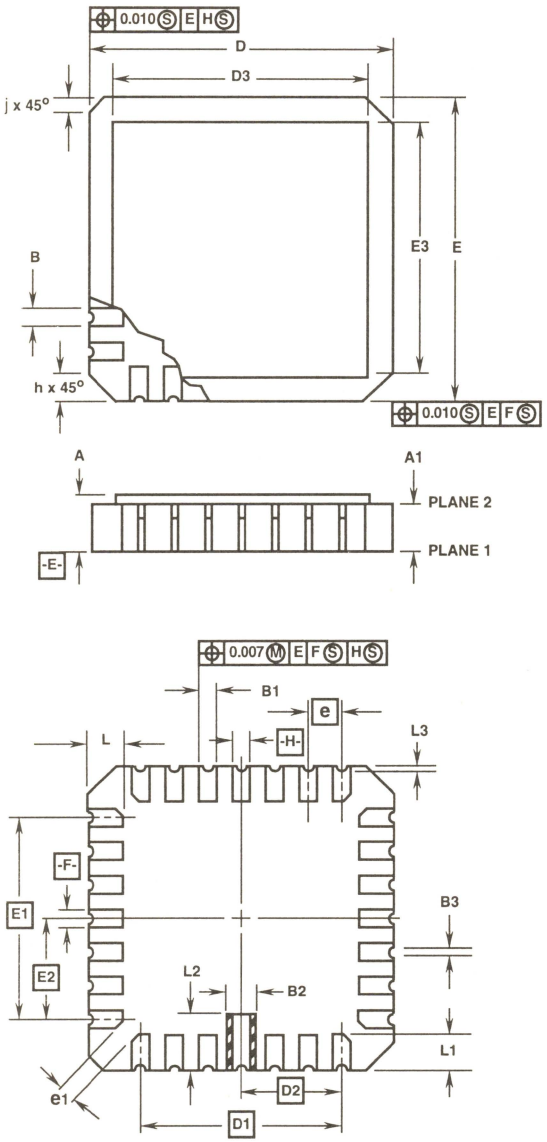
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.070	0.097	1.78	2.46	6, 7
A1	0.054	0.077	1.37	1.96	-
B	-	-	-	-	-
B1	0.020	0.030	0.51	0.76	2, 4
B2	0.072 REF		1.83 REF		-
B3	0.006	0.022	0.15	0.56	-
D	0.342	0.358	8.69	9.09	-
D1	0.200 BSC		5.08 BSC		-
D2	0.100 BSC		2.54 BSC		-
D3	0.325	0.335	8.26	8.51	2
E	0.342	0.358	8.69	9.09	-
E1	0.200 BSC		5.08 BSC		-
E2	0.100 BSC		2.54 BSC		-
E3	0.325	0.335	8.26	8.51	2
e	0.050 BSC		1.27 BSC		-
e1	0.015	-	0.38	-	2
h	0.040 REF		1.02 REF		5
j	0.020 REF		0.51 REF		5
L	0.042	0.058	1.07	1.47	-
L1	0.042	0.058	1.07	1.47	-
L2	0.075	0.095	1.91	2.41	-
L3	0.003	0.015	0.08	0.38	-
ND	5		5		3
NE	5		5		3
N	20		20		3

Rev. 0 5/18/94

NOTES:

1. Metallized castellations shall be connected to plane 1 terminals and extend toward plane 2 across at least two layers of ceramic or completely across all of the ceramic layers to make electrical connection with the optional plane 2 terminals.
2. Unless otherwise specified, a minimum clearance of 0.015 inch (0.38mm) shall be maintained between all metallized features (e.g., lid, castellations, terminals, thermal pads, etc.)
3. Symbol "N" is the maximum number of terminals. Symbols "ND" and "NE" are the number of terminals along the sides of length "D" and "E", respectively.
4. The required plane 1 terminals and optional plane 2 terminals (if used) shall be electrically connected.
5. The corner shape (square, notch, radius, etc.) may vary at the manufacturer's option, from that shown on the drawing.
6. Chip carriers shall be constructed of a minimum of two ceramic layers.
7. Dimension "A" controls the overall package thickness. The maximum "A" dimension is package height before being solder dipped.
8. Dimensioning and tolerancing per ANSI Y14.5M-1982.
9. Controlling dimension: INCH.

Ceramic Leadless Chip Carrier Packages (CLCC)



J20.C MIL-STD-1835 CQCC3-N20 (C-13)

20 PAD CERAMIC LEADLESS CHIP CARRIER PACKAGE

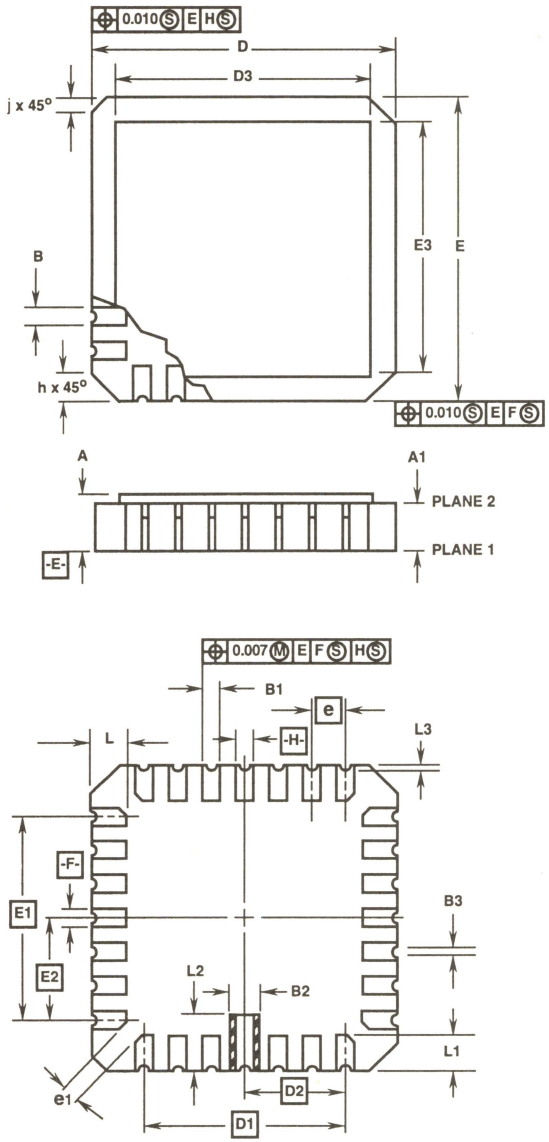
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.060	0.120	1.52	3.05	6, 7
A1	0.050	0.088	1.27	2.23	-
B	-	-	-	-	-
B1	0.022	0.028	0.56	0.71	2, 4
B2	0.072 REF		1.83 REF		-
B3	0.006	0.022	0.15	0.56	-
D	0.280	0.305	7.11	7.75	-
D1	0.150 BSC		3.81 BSC		-
D2	0.075 BSC		1.90 BSC		-
D3	-	0.305	-	7.75	2
E	0.420	0.440	10.67	11.18	-
E1	0.250 BSC		6.35 BSC		-
E2	0.125 BSC		3.17 BSC		-
E3	-	0.440	-	11.18	2
e	0.050 BSC		1.27 BSC		-
e1	0.015	-	0.38	-	2
h	0.040 REF		1.02 REF		5
j	0.020 REF		0.51 REF		5
L	0.045	0.055	1.14	1.40	-
L1	0.045	0.055	1.14	1.40	-
L2	0.075	0.095	1.91	2.41	-
L3	0.003	0.015	0.08	0.38	-
ND	4		4		3
NE	6		6		3
N	20		20		3

Rev. 0 6/13/95

NOTES:

1. Metallized castellations shall be connected to plane 1 terminals and extend toward plane 2 across at least two layers of ceramic or completely across all of the ceramic layers to make electrical connection with the optional plane 2 terminals.
2. Unless otherwise specified, a minimum clearance of 0.015 inch (0.38mm) shall be maintained between all metallized features (e.g., lid, castellations, terminals, thermal pads, etc.)
3. Symbol "N" is the maximum number of terminals. Symbols "ND" and "NE" are the number of terminals along the sides of length "D" and "E", respectively.
4. The required plane 1 terminals and optional plane 2 terminals (if used) shall be electrically connected.
5. The corner shape (square, notch, radius, etc.) may vary at the manufacturer's option, from that shown on the drawing.
6. Chip carriers shall be constructed of a minimum of two ceramic layers.
7. Dimension "A" controls the overall package thickness. The maximum "A" dimension is package height before being solder dipped.
8. Dimensioning and tolerancing per ANSI Y14.5M-1982.
9. Controlling dimension: INCH.

Ceramic Leadless Chip Carrier Packages (CLCC)



J28.A MIL-STD-1835 CQCC1-N28 (C-4)
28 PAD CERAMIC LEADLESS CHIP CARRIER PACKAGE

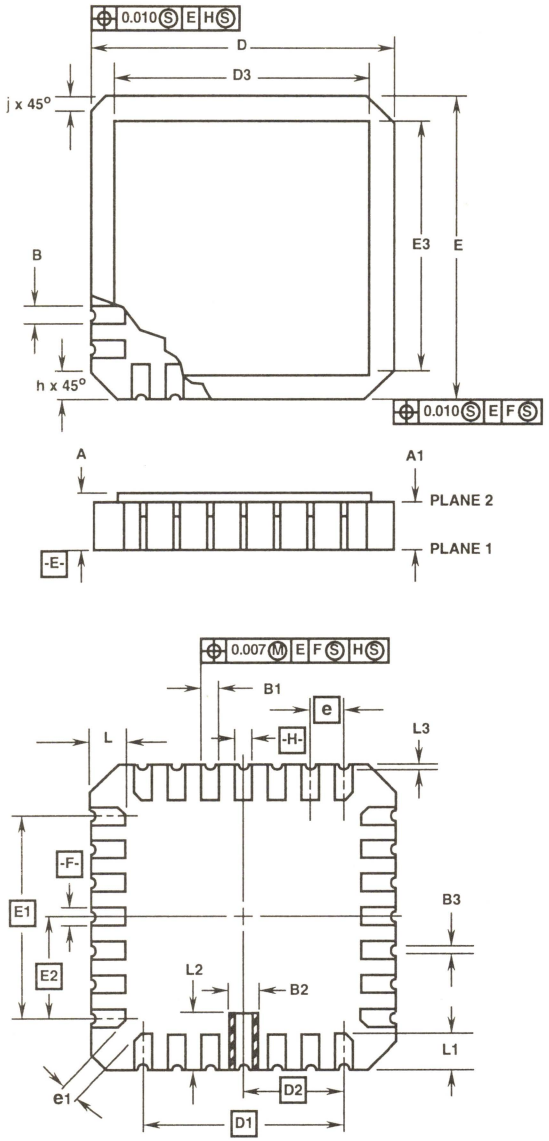
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.060	0.100	1.52	2.54	6, 7
A1	0.050	0.088	1.27	2.23	-
B	-	-	-	-	-
B1	0.022	0.028	0.56	0.71	2, 4
B2	0.072 REF		1.83 REF		-
B3	0.006	0.022	0.15	0.56	-
D	0.442	0.460	11.23	11.68	-
D1	0.300 BSC		7.62 BSC		-
D2	0.150 BSC		3.81 BSC		-
D3	-	0.460	-	11.68	2
E	0.442	0.460	11.23	11.68	-
E1	0.300 BSC		7.62 BSC		-
E2	0.150 BSC		3.81 BSC		-
E3	-	0.460	-	11.68	2
e	0.050 BSC		1.27 BSC		-
e1	0.015	-	0.38	-	2
h	0.040 REF		1.02 REF		5
j	0.020 REF		0.51 REF		5
L	0.045	0.055	1.14 .	1.40	-
L1	0.045	0.055	1.14	1.40	-
L2	0.075	0.095	1.90	2.41	-
L3	0.003	0.015	0.08	0.038	-
ND	7		7		3
NE	7		7		3
N	28		28		3

Rev. 0 5/18/94

NOTES:

1. Metallized castellations shall be connected to plane 1 terminals and extend toward plane 2 across at least two layers of ceramic or completely across all of the ceramic layers to make electrical connection with the optional plane 2 terminals.
2. Unless otherwise specified, a minimum clearance of 0.015 inch (0.38mm) shall be maintained between all metallized features (e.g., lid, castellations, terminals, thermal pads, etc.)
3. Symbol "N" is the maximum number of terminals. Symbols "ND" and "NE" are the number of terminals along the sides of length "D" and "E", respectively.
4. The required plane 1 terminals and optional plane 2 terminals (if used) shall be electrically connected.
5. The corner shape (square, notch, radius, etc.) may vary at the manufacturer's option, from that shown on the drawing.
6. Chip carriers shall be constructed of a minimum of two ceramic layers.
7. Dimension "A" controls the overall package thickness. The maximum "A" dimension is package height before being solder dipped.
8. Dimensioning and tolerancing per ANSI Y14.5M-1982.
9. Controlling dimension: INCH.

Ceramic Leadless Chip Carrier Packages (CLCC)



J32.A MIL-STD-1835 CQCC1-N32 (C-12)
32 PAD CERAMIC LEADLESS CHIP CARRIER PACKAGE

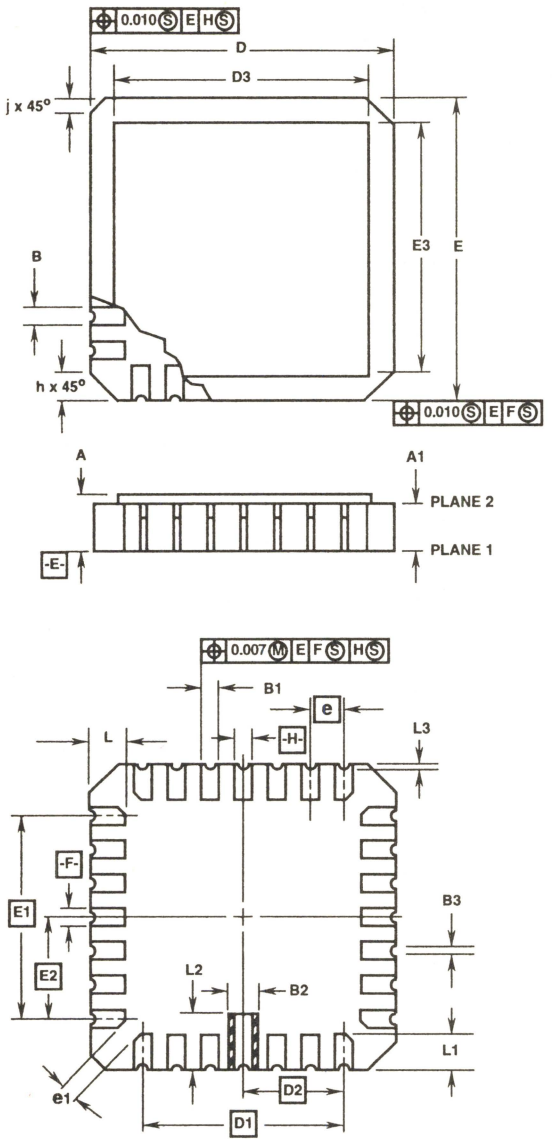
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.060	0.120	1.52	3.05	6, 7
A1	0.050	0.088	1.27	2.23	-
B	-	-	-	-	-
B1	0.022	0.028	0.56	0.71	2, 4
B2	0.072 REF		1.83 REF		-
B3	0.006	0.022	0.15	0.56	-
D	0.442	0.458	11.23	11.63	-
D1	0.300 BSC		7.62 BSC		-
D2	0.150 BSC		3.81 BSC		-
D3	-	0.458	-	11.63	2
E	0.540	0.560	13.72	14.22	-
E1	0.400 BSC		10.16 BSC		-
E2	0.200 BSC		5.08 BSC		-
E3	-	0.558	-	14.17	2
e	0.050 BSC		1.27 BSC		-
e1	0.015	-	0.38	-	2
h	0.040 REF		1.02 REF		5
j	0.020 REF		0.51 REF		5
L	0.045	0.055	1.14	1.40	-
L1	0.045	0.055	1.14	1.40	-
L2	0.075	0.095	1.90	2.41	-
L3	0.003	0.015	0.08	0.038	-
ND	7		7		3
NE	9		9		3
N	32		32		3

Rev. 0 6/13/95

NOTES:

1. Metallized castellations shall be connected to plane 1 terminals and extend toward plane 2 across at least two layers of ceramic or completely across all of the ceramic layers to make electrical connection with the optional plane 2 terminals.
2. Unless otherwise specified, a minimum clearance of 0.015 inch (0.38mm) shall be maintained between all metallized features (e.g., lid, castellations, terminals, thermal pads, etc.)
3. Symbol "N" is the maximum number of terminals. Symbols "ND" and "NE" are the number of terminals along the sides of length "D" and "E", respectively.
4. The required plane 1 terminals and optional plane 2 terminals (if used) shall be electrically connected.
5. The corner shape (square, notch, radius, etc.) may vary at the manufacturer's option, from that shown on the drawing.
6. Chip carriers shall be constructed of a minimum of two ceramic layers.
7. Dimension "A" controls the overall package thickness. The maximum "A" dimension is package height before being solder dipped.
8. Dimensioning and tolerancing per ANSI Y14.5M-1982.
9. Controlling dimension: INCH.

Ceramic Leadless Chip Carrier Packages (CLCC)



J44.A MIL-STD-1835 CQCC1-N44 (C-5)
44 PAD CERAMIC LEADLESS CHIP CARRIER PACKAGE

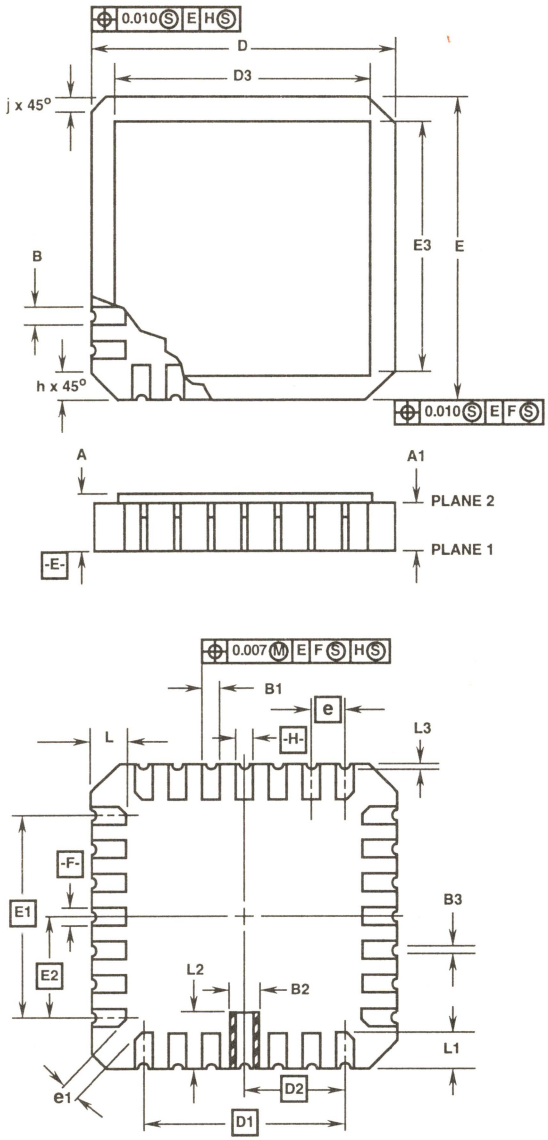
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.064	0.120	1.63	3.05	6, 7
A1	0.054	0.088	1.37	2.24	-
B	0.033	0.039	0.84	0.99	4
B1	0.022	0.028	0.56	0.71	2, 4
B2	0.072 REF		1.83 REF		-
B3	0.006	0.022	0.15	0.56	-
D	0.640	0.662	16.26	16.81	-
D1	0.500 BSC		12.70 BSC		-
D2	0.250 BSC		6.35 BSC		-
D3	-	0.662	-	16.81	2
E	0.640	0.662	16.26	16.81	-
E1	0.500 BSC		12.70 BSC		-
E2	0.250 BSC		6.35 BSC		-
E3	-	0.662	-	16.81	2
e	0.050 BSC		1.27 BSC		-
e1	0.015	-	0.38	-	2
h	0.040 REF		1.02 REF		5
j	0.020 REF		0.51 REF		5
L	0.045	0.055	1.14	1.40	-
L1	0.045	0.055	1.14	1.40	-
L2	0.075	0.095	1.90	2.41	-
L3	0.003	0.015	0.08	0.38	-
ND	11		11		3
NE	11		11		3
N	44		44		3

Rev. 0 5/18/94

NOTES:

1. Metallized castellations shall be connected to plane 1 terminals and extend toward plane 2 across at least two layers of ceramic or completely across all of the ceramic layers to make electrical connection with the optional plane 2 terminals.
2. Unless otherwise specified, a minimum clearance of 0.015 inch (0.38mm) shall be maintained between all metallized features (e.g., lid, castellations, terminals, thermal pads, etc.)
3. Symbol "N" is the maximum number of terminals. Symbols "ND" and "NE" are the number of terminals along the sides of length "D" and "E", respectively.
4. The required plane 1 terminals and optional plane 2 terminals (if used) shall be electrically connected.
5. The corner shape (square, notch, radius, etc.) may vary at the manufacturer's option, from that shown on the drawing.
6. Chip carriers shall be constructed of a minimum of two ceramic layers.
7. Dimension "A" controls the overall package thickness. The maximum "A" dimension is package height before being solder dipped.
8. Dimensioning and tolerancing per ANSI Y14.5M-1982.
9. Controlling dimension: INCH.

Ceramic Leadless Chip Carrier Packages (CLCC)



J44.B

44 PAD CERAMIC LEADLESS CHIP CARRIER PACKAGE

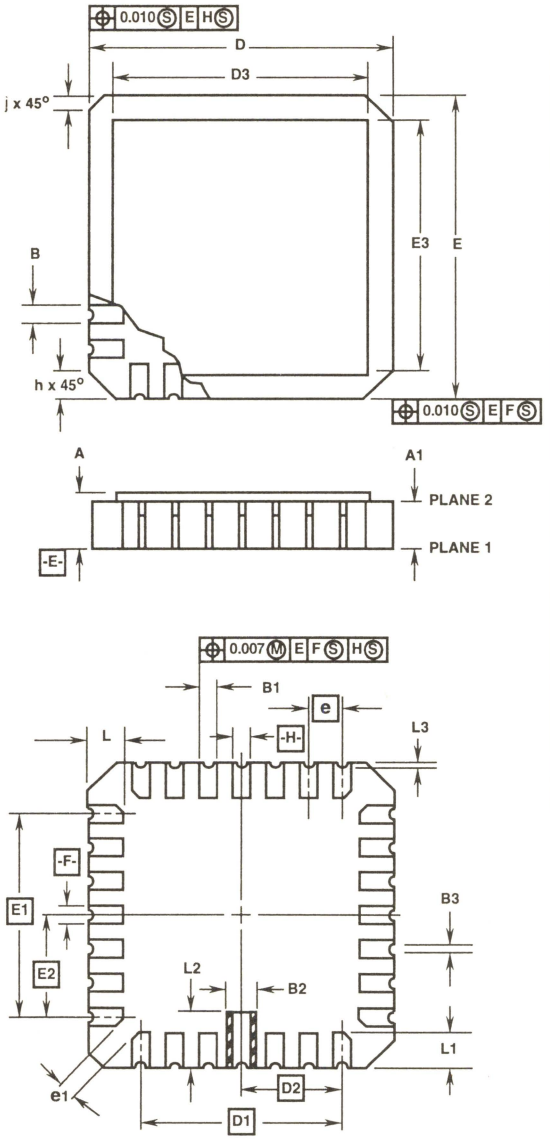
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.067	0.087	1.70	2.20	6, 7
A1	0.058	0.072	1.47	1.83	-
B	-	-	-	-	-
B1	0.022	0.028	0.56	0.71	2, 4
B3	0.006	0.022	0.15	0.56	-
D	0.640	0.664	16.26	16.86	-
D1	0.500 BSC		12.70 BSC		-
D2	0.250 BSC		6.35 BSC		-
D3	0.484	0.50	12.30	12.70	2
E	0.640	0.664	16.26	16.86	-
E1	0.500 BSC		12.70 BSC		-
E2	0.250 BSC		6.35 BSC		-
E3	0.484	0.500	12.3	12.7	2
e	0.050 BSC		1.27 BSC		-
e1	0.015	-	0.38	-	2
h	0.040 REF		1.02 REF		5
j	0.020 REF		0.51 REF		5
L	0.045	0.055	0.614	1.4	-
L1	0.045	0.055	0.614	1.4	-
L2	0.065	0.105	1.66	2.66	-
L3	0.003	0.015	0.08	0.38	-
ND	11		11		3
NE	11		11		3
N	44		44		3

Rev. 0 5/18/94

NOTES:

1. Metallized castellations shall be connected to plane 1 terminals and extend toward plane 2 across at least two layers of ceramic or completely across all of the ceramic layers to make electrical connection with the optional plane 2 terminals.
2. Unless otherwise specified, a minimum clearance of 0.015 inch (0.38mm) shall be maintained between all metallized features (e.g., lid, castellations, terminals, thermal pads, etc.)
3. Symbol "N" is the maximum number of terminals. Symbols "ND" and "NE" are the number of terminals along the sides of length "D" and "E", respectively.
4. The required plane 1 terminals and optional plane 2 terminals (if used) shall be electrically connected.
5. The corner shape (square, notch, radius, etc.) may vary at the manufacturer's option, from that shown on the drawing.
6. Chip carriers shall be constructed of a minimum of two ceramic layers.
7. Dimension "A" controls the overall package thickness. The maximum "A" dimension is package height before being solder dipped.
8. Dimensioning and tolerancing per ANSI Y14.5M-1982.
9. Controlling dimension: INCH.

Ceramic Leadless Chip Carrier Packages (CLCC)



J68.A

68 PAD CERAMIC LEADLESS CHIP CARRIER PACKAGE

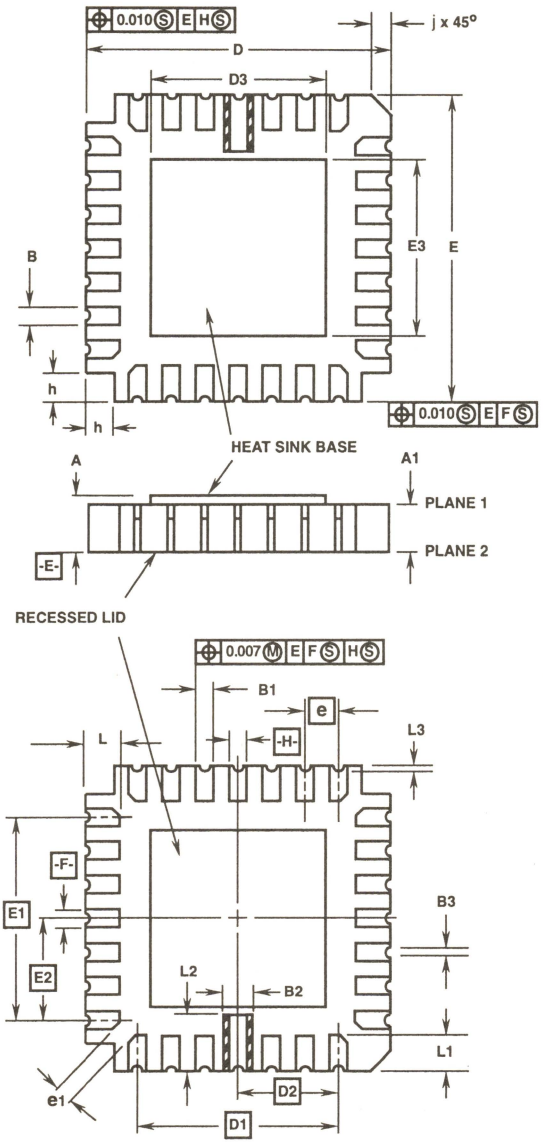
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.067	0.087	1.70	2.20	6, 7
A1	0.058	0.072	1.47	1.83	-
B	-	-	-	-	-
B1	0.033	0.039	0.85	0.99	2, 4
B3	0.006	0.022	0.15	0.56	-
D	0.940	0.965	23.88	24.51	-
D1	0.800 BSC		20.32 BSC		-
D2	0.400 BSC		10.16 BSC		-
D3	0.616	0.632	15.65	16.05	2
E	0.940	0.965	23.88	24.51	-
E1	0.800 BSC		20.32 BSC		-
E2	0.400 BSC		10.16 BSC		-
E3	0.616	0.632	15.65	16.05	2
e	0.050 BSC		1.27 BSC		-
e1	0.015	-	0.38	-	2
j	0.040 Ref		1.00 Ref		5
L	0.045	0.055	1.14	1.40	-
L1	0.045	0.055	1.14	1.40	-
L2	0.075	0.095	1.91	2.41	-
L3	0.003	0.015	0.08	0.38	-
ND	17		17		3
NE	17		17		3
N	68		68		3

Rev. 0 5/18/94

NOTES:

1. Metallized castellations shall be connected to plane 1 terminals and extend toward plane 2 across at least two layers of ceramic or completely across all of the ceramic layers to make electrical connection with the optional plane 2 terminals.
2. Unless otherwise specified, a minimum clearance of 0.015 inch (0.38mm) shall be maintained between all metallized features (e.g., lid, castellations, terminals, thermal pads, etc.)
3. Symbol "N" is the maximum number of terminals. Symbols "ND" and "NE" are the number of terminals along the sides of length "D" and "E", respectively.
4. The required plane 1 terminals and optional plane 2 terminals (if used) shall be electrically connected.
5. The corner shape (square, notch, radius, etc.) may vary at the manufacturer's option, from that shown on the drawing.
6. Chip carriers shall be constructed of a minimum of two ceramic layers.
7. Dimension "A" controls the overall package thickness. The maximum "A" dimension is package height before being solder dipped.
8. Dimensioning and tolerancing per ANSI Y14.5M-1982.
9. Controlling dimension: INCH.

Ceramic Leadless Chip Carrier Packages (CLCC)



J68.B

68 PAD CERAMIC LEADLESS CHIP CARRIER PACKAGE

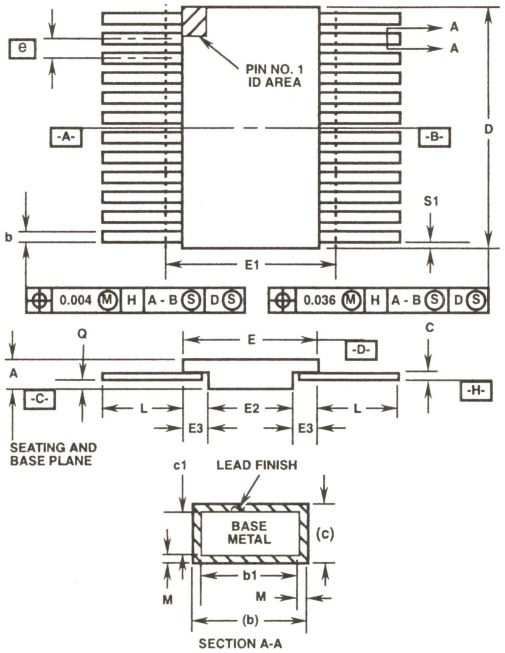
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.092	0.118	2.34	3.00	6, 7
A1	0.067	0.083	1.71	2.11	-
B	0.033	0.039	0.85	0.99	-
B1	0.033	0.039	0.85	0.99	2, 4
B2	0.072 Ref		1.83 Ref		-
B3	0.006	0.022	0.15	0.56	-
D	0.940	0.960	23.88	24.38	-
D1	0.800 BSC		20.32 BSC		-
D2	0.400 BSC		10.16 BSC		-
D3	0.695	0.705	17.65	17.91	2
E	0.940	0.960	23.88	24.38	-
E1	0.800 BSC		20.32 BSC		-
E2	0.400 BSC		10.16 BSC		-
E3	0.695	0.705	17.65	17.91	2
e	0.050 BSC		1.27 BSC		-
e1	0.015	-	0.38	-	2
h	0.050 Ref		1.27 Ref		5
j	0.020 Ref		0.51 Ref		5
L	0.042	0.058	1.07	1.47	-
L1	0.042	0.058	1.07	1.47	-
L2	0.080	0.090	2.03	2.29	-
L3	0.003	0.015	0.08	0.38	-
ND	17		17		3
NE	17		17		3
N	68		68		3

Rev. 0 5/31/94

NOTES:

1. Metallized castellations shall be connected to plane 1 terminals and extend toward plane 2 across all of the ceramic layers to make electrical connection with the required plane 2 terminals.
2. Unless otherwise specified, a minimum clearance of 0.015 inch (0.38mm) shall be maintained between all metallized features (e.g., lid, castellations, terminals, thermal pads, etc.)
3. Symbol "N" is the maximum number of terminals. Symbols "ND" and "NE" are the number of terminals along the sides of length "D" and "E", respectively.
4. The required plane 1 terminals and required plane 2 terminals shall be electrically connected.
5. The corner shape (square, notch, radius, etc.) may vary at the manufacturer's option, from that shown on the drawing.
6. Chip carriers shall be constructed of a minimum of two ceramic layers.
7. Dimension "A" controls the overall package thickness. The maximum "A" dimension is package height before being solder dipped.
8. Dimensioning and tolerancing per ANSI Y14.5M-1982.
9. Controlling dimension: INCH.

Ceramic Metal Seal Flatpack Packages (Flatpack)



K14.A MIL-STD-1835 CDFP3-F14 (F-2A, CONFIGURATION B)
14 LEAD CERAMIC METAL SEAL FLATPACK PACKAGE

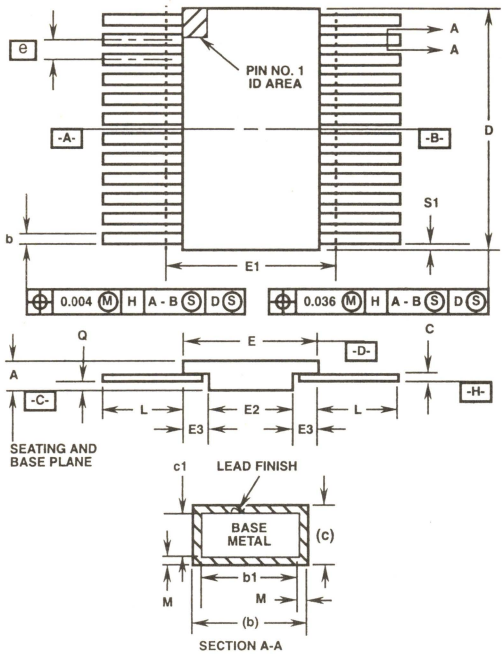
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.045	0.115	1.14	2.92	-
b	0.015	0.022	0.38	0.56	-
b1	0.015	0.019	0.38	0.48	-
c	0.004	0.009	0.10	0.23	-
c1	0.004	0.006	0.10	0.15	-
D	-	0.390	-	9.91	3
E	0.235	0.260	5.97	6.60	-
E1	-	0.290	-	7.11	3
E2	0.125	-	3.18	-	-
E3	0.030	-	0.76	-	7
e	0.050 BSC		1.27 BSC		-
k	0.008	0.015	0.20	0.38	2
L	0.270	0.370	6.86	9.40	-
Q	0.026	0.045	0.66	1.14	8
S1	0.005	-	0.13	-	6
M	-	0.0015	-	0.04	-
N	14		14		-

Rev. 0 5/18/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark. Alternately, a tab (dimension k) may be used to identify pin one.
2. If a pin one identification mark is used in addition to a tab, the limits of dimension k do not apply.
3. This dimension allows for off-center lid, meniscus, and glass overrun.
4. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
5. N is the maximum number of terminal positions.
6. Measure dimension S1 at all four corners.
7. For bottom-brazed lead packages, no organic or polymeric materials shall be molded to the bottom of the package to cover the leads.
8. Dimension Q shall be measured at the point of exit (beyond the meniscus) of the lead from the body. Dimension Q minimum shall be reduced by 0.0015 inch (0.038mm) maximum when solder dip lead finish is applied.
9. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
10. Controlling dimension: INCH.

Ceramic Metal Seal Flatpack Packages (Flatpack)



K14.B

14 LEAD CERAMIC METAL SEAL FLATPACK PACKAGE

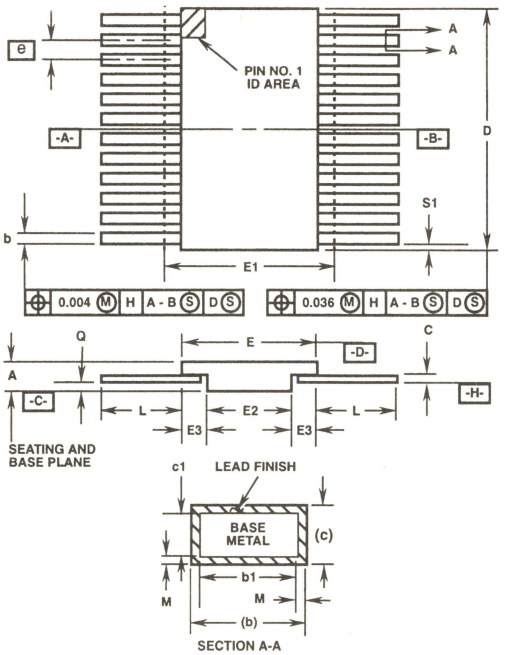
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.045	0.115	1.14	2.92	-
b	0.015	0.022	0.38	0.56	-
b1	0.015	0.019	0.38	0.48	-
c	0.003	0.009	0.08	0.23	-
c1	0.003	0.007	0.08	0.18	-
D	-	0.390	-	9.91	3
E	0.235	0.260	5.97	6.60	-
E1	-	0.290	-	7.11	3
E2	0.125	-	3.18	-	-
E3	0.030	-	0.76	-	7
e	0.050 BSC		1.27 BSC		-
k	0.008	0.015	0.20	0.38	2
L	0.270	0.370	6.86	9.40	-
Q	0.010	0.020	0.25	0.51	8
S1	0.005	-	0.13	-	6
M	-	0.0015	-	0.04	-
N	14		14		-

Rev. 0 6/14/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark. Alternately, a tab (dimension k) may be used to identify pin one.
2. If a pin one identification mark is used in addition to a tab, the limits of dimension k do not apply.
3. This dimension allows for off-center lid, meniscus, and glass overrun.
4. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
5. N is the maximum number of terminal positions.
6. Measure dimension S1 at all four corners.
7. For bottom-brazed lead packages, no organic or polymeric materials shall be molded to the bottom of the package to cover the leads.
8. Dimension Q shall be measured at the point of exit (beyond the meniscus) of the lead from the body. Dimension Q minimum shall be reduced by 0.0015 inch (0.038mm) maximum when solder dip lead finish is applied.
9. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
10. Controlling dimension: INCH.

Ceramic Metal Seal Flatpack Packages (Flatpack)



K16.A MIL-STD-1835 CDFP4-F16 (F-5A, CONFIGURATION B)
16 LEAD CERAMIC METAL SEAL FLATPACK PACKAGE

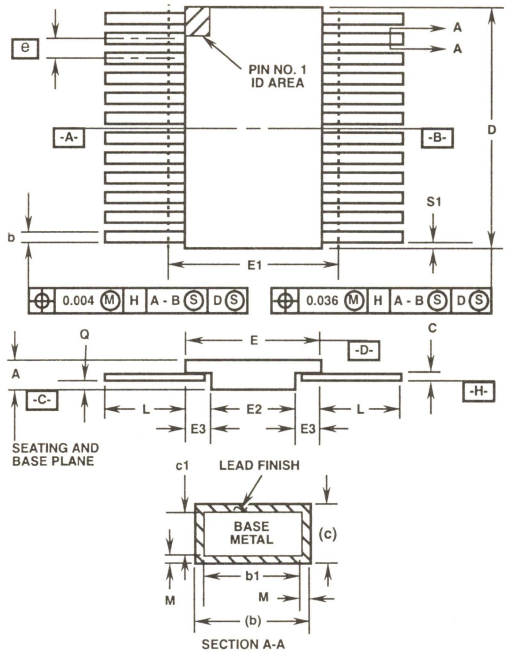
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.045	0.115	1.14	2.92	-
b	0.015	0.022	0.38	0.56	-
b1	0.015	0.019	0.38	0.48	-
c	0.004	0.009	0.10	0.23	-
c1	0.004	0.006	0.10	0.15	-
D	-	0.440	-	11.18	3
E	0.245	0.285	6.22	7.24	-
E1	-	0.315	-	8.00	3
E2	0.130	-	3.30	-	-
E3	0.030	-	0.76	-	7
e	0.050 BSC		1.27 BSC		-
k	0.008	0.015	0.20	0.38	2
L	0.250	0.370	6.35	9.40	-
Q	0.026	0.045	0.66	1.14	8
S1	0.005	-	0.13	-	6
M	-	0.0015	-	0.04	-
N	16		16		-

Rev. 1 2-20-95

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark. Alternately, a tab (dimension k) may be used to identify pin one.
2. If a pin one identification mark is used in addition to a tab, the limits of dimension k do not apply.
3. This dimension allows for off-center lid, meniscus, and glass overrun.
4. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
5. N is the maximum number of terminal positions.
6. Measure dimension S1 at all four corners.
7. For bottom-brazed lead packages, no organic or polymeric materials shall be molded to the bottom of the package to cover the leads.
8. Dimension Q shall be measured at the point of exit (beyond the meniscus) of the lead from the body. Dimension Q minimum shall be reduced by 0.0015 inch (0.038mm) maximum when solder dip lead finish is applied.
9. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
10. Controlling dimension: INCH.

Ceramic Metal Seal Flatpack Packages (Flatpack)



K16.B

16 LEAD CERAMIC METAL SEAL FLATPACK PACKAGE

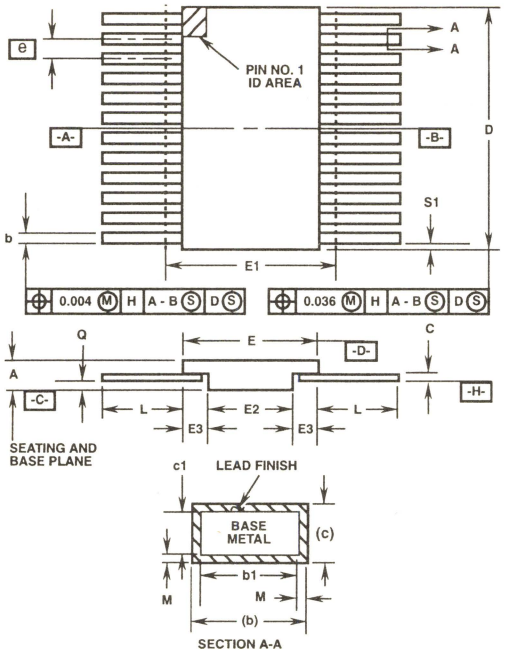
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.115	-	2.92	-
b	0.015	0.022	0.38	0.56	-
b1	0.015	0.019	0.38	0.48	-
c	0.003	0.009	0.08	0.23	-
c1	0.003	0.006	0.08	0.15	-
D	-	0.440	-	11.18	3
E	0.280	0.295	7.24	7.49	-
E1	-	0.315	-	8.00	3
E2	0.130	-	3.30	-	-
E3	0.030	-	0.76	-	7
e	0.050 BSC		1.27 BSC		-
k	0.008	0.015	0.20	0.38	2
L	0.250	0.370	6.35	9.40	-
Q	0.026	0.045	0.66	1.14	8
S1	0.005	-	0.13	-	6
M	-	0.0015	-	0.04	-
N	16		16		-

Rev. 0 5/18/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark. Alternately, a tab (dimension k) may be used to identify pin one.
2. If a pin one identification mark is used in addition to a tab, the limits of dimension k do not apply.
3. This dimension allows for off-center lid, meniscus, and glass overrun.
4. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
5. N is the maximum number of terminal positions.
6. Measure dimension S1 at all four corners.
7. For bottom-brazed lead packages, no organic or polymeric materials shall be molded to the bottom of the package to cover the leads.
8. Dimension Q shall be measured at the point of exit (beyond the meniscus) of the lead from the body. Dimension Q minimum shall be reduced by 0.0015 inch (0.038mm) maximum when solder dip lead finish is applied.
9. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
10. Controlling dimension: INCH.

Ceramic Metal Seal Flatpack Packages (Flatpack)



K16.D

16 LEAD CERAMIC METAL SEAL FLATPACK PACKAGE

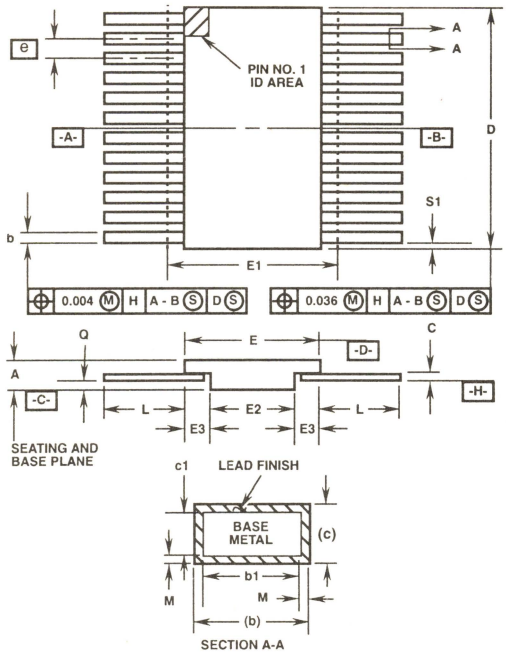
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.045	0.115	1.14	2.92	-
b	0.015	0.022	0.38	0.56	-
b1	0.015	0.019	0.38	0.48	-
c	0.003	0.009	0.08	0.23	-
c1	0.003	0.007	0.08	0.18	-
D	-	0.440	-	11.18	3
E	0.245	0.285	6.22	7.24	-
E1	-	0.315	-	8.00	3
E2	0.130	-	3.30	-	-
E3	0.030	-	0.76	-	7
e	0.050 BSC		1.27 BSC		-
k	0.008	0.015	0.20	0.38	2
L	0.250	0.370	6.35	9.40	-
Q	0.010	0.020	0.25	0.51	8
S1	0.000	-	0.00	-	6
M	-	0.0015	-	0.04	-
N	16		16		-

Rev. 0 6/14/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark. Alternately, a tab (dimension k) may be used to identify pin one.
2. If a pin one identification mark is used in addition to a tab, the limits of dimension k do not apply.
3. This dimension allows for off-center lid, meniscus, and glass overrun.
4. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
5. N is the maximum number of terminal positions.
6. Measure dimension S1 at all four corners.
7. For bottom-brazed lead packages, no organic or polymeric materials shall be molded to the bottom of the package to cover the leads.
8. Dimension Q shall be measured at the point of exit (beyond the meniscus) of the lead from the body. Dimension Q minimum shall be reduced by 0.0015 inch (0.038mm) maximum when solder dip lead finish is applied.
9. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
10. Controlling dimension: INCH.

Ceramic Metal Seal Flatpack Packages (Flatpack)



K18.A

18 LEAD CERAMIC METAL SEAL FLATPACK PACKAGE

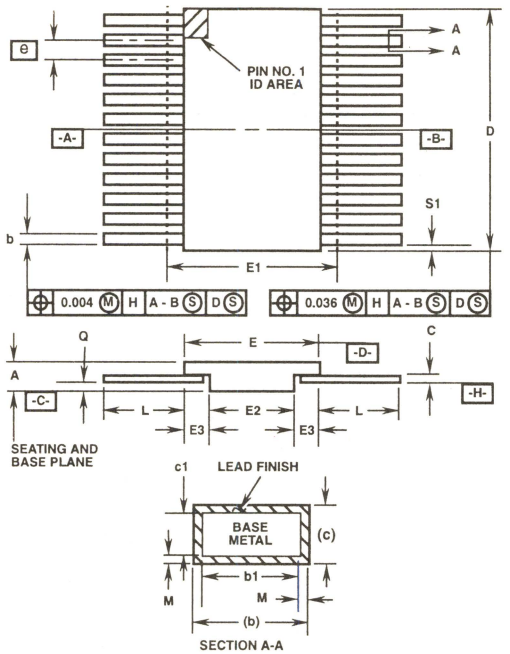
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.100	-	2.54	-
b	0.015	0.022	0.38	0.56	-
b1	0.015	0.019	0.38	0.48	-
c	0.004	0.009	0.10	0.23	-
c1	0.004	0.006	0.10	0.15	-
D	0.430	0.450	10.92	11.43	3
E	0.320	0.340	8.13	8.64	-
E1	-	0.360	-	9.14	3
E2	0.220	0.240	5.59	6.10	-
E3	0.030	-	0.76	-	7
e	0.050 BSC		1.27 BSC		-
k	0.008	0.015	0.20	0.38	2
L	0.280	0.320	7.11	8.13	-
Q	0.012	-	0.30	-	8
S1	-	-	-	-	-
M	-	0.0015	-	0.04	-
N	18		18		-

Rev. 0 5/18/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark. Alternately, a tab (dimension k) may be used to identify pin one.
2. If a pin one identification mark is used in addition to a tab, the limits of dimension k do not apply.
3. This dimension allows for off-center lid, meniscus, and glass overrun.
4. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
5. N is the maximum number of terminal positions.
6. Measure dimension S1 at all four corners.
7. For bottom-brazed lead packages, no organic or polymeric materials shall be molded to the bottom of the package to cover the leads.
8. Dimension Q shall be measured at the point of exit (beyond the meniscus) of the lead from the body. Dimension Q minimum shall be reduced by 0.0015 inch (0.038mm) maximum when solder dip lead finish is applied.
9. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
10. Controlling dimension: INCH.

Ceramic Metal Seal Flatpack Packages (Flatpack)



K20.A MIL-STD-1835 CDFP4-F20 (F-9A, CONFIGURATION B)
20 LEAD CERAMIC METAL SEAL FLATPACK PACKAGE

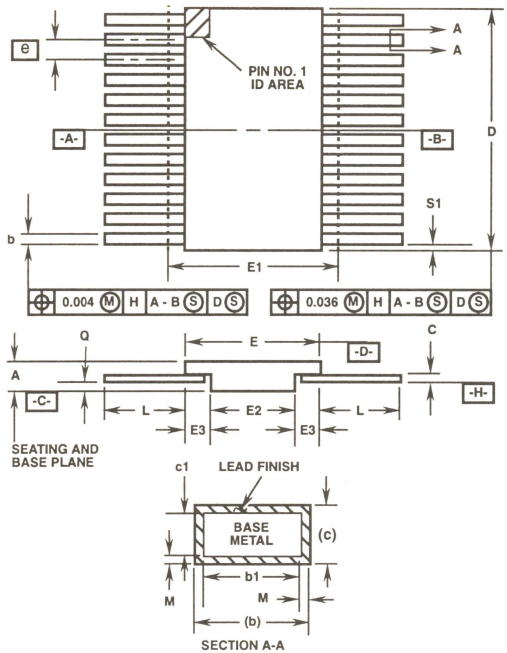
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.045	0.115	1.14	2.92	-
b	0.015	0.022	0.38	0.56	-
b1	0.015	0.019	0.38	0.48	-
c	0.004	0.009	0.10	0.23	-
c1	0.004	0.006	0.10	0.15	-
D	-	0.540	-	13.72	3
E	0.245	0.300	6.22	7.62	-
E1	-	0.330	-	8.38	3
E2	0.130	-	3.30	-	-
E3	0.030	-	0.76	-	7
e	0.050 BSC		1.27 BSC		-
k	0.008	0.015	0.20	0.38	2
L	0.250	0.370	6.35	9.40	-
Q	0.026	0.045	0.66	1.14	8
S1	0.00	-	0.00	-	6
M	-	0.0015	-	0.04	-
N	20		20		-

Rev. 0 5/18/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark. Alternately, a tab (dimension k) may be used to identify pin one.
2. If a pin one identification mark is used in addition to a tab, the limits of dimension k do not apply.
3. This dimension allows for off-center lid, meniscus, and glass overrun.
4. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
5. N is the maximum number of terminal positions.
6. Measure dimension S1 at all four corners.
7. For bottom-brazed lead packages, no organic or polymeric materials shall be molded to the bottom of the package to cover the leads.
8. Dimension Q shall be measured at the point of exit (beyond the meniscus) of the lead from the body. Dimension Q minimum shall be reduced by 0.0015 inch (0.038mm) maximum when solder dip lead finish is applied.
9. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
10. Controlling dimension: INCH.

Ceramic Metal Seal Flatpack Packages (Flatpack)



K24.A MIL-STD-1835 CDFP4-F24 (F-6A, CONFIGURATION B)
24 LEAD CERAMIC METAL SEAL FLATPACK PACKAGE

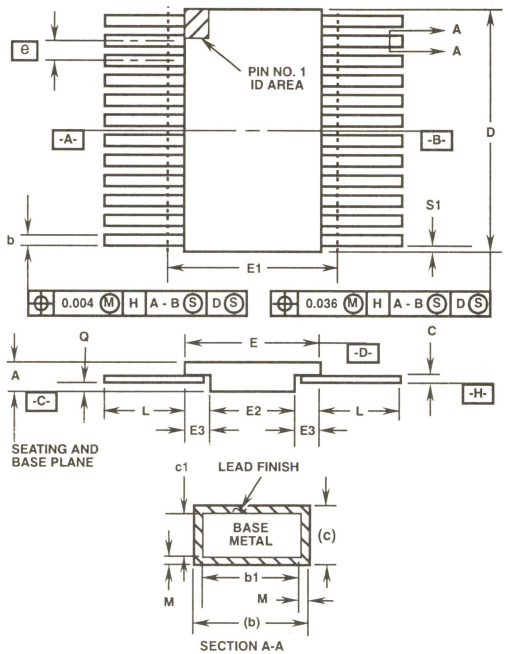
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.045	0.115	1.14	2.92	-
b	0.015	0.022	0.38	0.56	-
b1	0.015	0.019	0.38	0.48	-
c	0.004	0.009	0.10	0.23	-
c1	0.004	0.006	0.10	0.15	-
D	-	0.640	-	16.26	3
E	0.350	0.420	9.14	10.67	-
E1	-	0.450	-	11.43	3
E2	0.180	-	4.57	-	-
E3	0.030	-	0.76	-	7
e	0.050 BSC		1.27 BSC		-
k	0.008	0.015	0.20	0.38	2
L	0.250	0.370	6.35	9.40	-
Q	0.026	0.045	0.66	1.14	8
S1	0.005	-	0.13	-	6
M	-	0.0015	-	0.04	-
N	24		24		-

Rev. 0 5/18/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark. Alternately, a tab (dimension k) may be used to identify pin one.
2. If a pin one identification mark is used in addition to a tab, the limits of dimension k do not apply.
3. This dimension allows for off-center lid, meniscus, and glass overrun.
4. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
5. N is the maximum number of terminal positions.
6. Measure dimension S1 at all four corners.
7. For bottom-brazed lead packages, no organic or polymeric materials shall be molded to the bottom of the package to cover the leads.
8. Dimension Q shall be measured at the point of exit (beyond the meniscus) of the lead from the body. Dimension Q minimum shall be reduced by 0.0015 inch (0.038mm) maximum when solder dip lead finish is applied.
9. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
10. Controlling dimension: INCH.

Ceramic Metal Seal Flatpack Packages (Flatpack)



K24.B

24 LEAD CERAMIC METAL SEAL FLATPACK PACKAGE

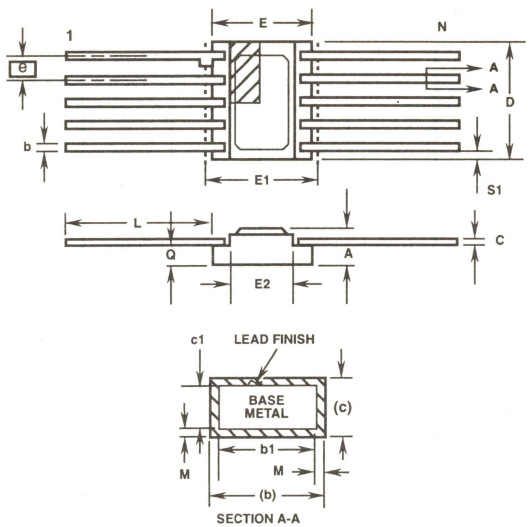
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.070	0.115	1.78	2.92	-
b	0.015	0.022	0.38	0.56	-
b1	0.015	0.019	0.38	0.48	-
c	0.004	0.009	0.10	0.23	-
c1	0.004	0.006	0.10	0.15	-
D	0.590	0.610	14.99	15.49	3
E	0.490	0.510	12.45	12.95	-
E1	-	0.520	-	13.20	3
E2	0.370	0.390	9.40	9.91	-
E3	0.030	-	0.76	-	7
e	0.050 BSC		1.27 BSC		-
k	-	-	-	-	-
L	0.330	0.350	8.38	8.89	-
Q	0.026	0.045	0.66	1.14	8
S1	0.005	-	0.13	-	6
M	-	0.0015	-	0.04	-
N	24		24		-

Rev. 0 5/18/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark. Alternately, a tab (dimension k) may be used to identify pin one.
2. If a pin one identification mark is used in addition to a tab, the limits of dimension k do not apply.
3. This dimension allows for off-center lid, meniscus, and glass overrun.
4. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
5. N is the maximum number of terminal positions.
6. Measure dimension S1 at all four corners.
7. For bottom-brazed lead packages, no organic or polymeric materials shall be molded to the bottom of the package to cover the leads.
8. Dimension Q shall be measured at the point of exit (beyond the meniscus) of the lead from the body. Dimension Q minimum shall be reduced by 0.0015 inch (0.038mm) maximum when solder dip lead finish is applied.
9. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
10. Controlling dimension: INCH.

Ceramic Metal Seal Flatpack Packages (Flatpack)



K24.D TOP BRAZED
24 LEAD CERAMIC METAL SEAL FLATPACK PACKAGE

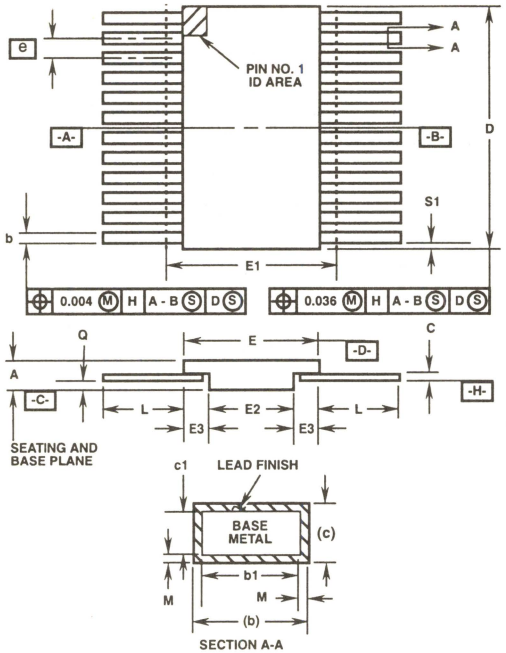
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.045	0.115	1.14	2.92	-
b	0.017	0.025	0.43	0.64	-
b1	0.017	0.022	0.43	0.56	-
c	0.003	0.010	0.08	0.26	-
c1	0.003	0.007	0.08	0.18	-
D	-	0.720	-	18.29	-
E	0.630	0.650	16.00	16.51	-
E1	-	0.680	-	17.27	3
E2	0.530	-	13.46	-	-
e	0.050 BSC		1.27 BSC		-
k	-	-	-	-	-
L	0.250	0.370	6.35	9.40	-
Q	0.026	0.050	0.66	1.27	-
S1	0.000	-	0.000	-	-
M	-	0.0015	-	0.04	-
N	24		24		-

Rev. 0 6/17/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark. Alternately, a tab (dimension k) may be used to identify pin one.
2. If a pin one identification mark is used in addition to a tab, the limits of dimension k do not apply.
3. This dimension allows for off-center lid, meniscus, and glass overrun.
4. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
5. N is the maximum number of terminal positions.
6. Measure dimension S1 at all four corners.
7. For bottom-brazed lead packages, no organic or polymeric materials shall be molded to the bottom of the package to cover the leads.
8. Dimension Q shall be measured at the point of exit (beyond the meniscus) of the lead from the body. Dimension Q minimum shall be reduced by 0.0015 inch (0.038mm) maximum when solder dip lead finish is applied.
9. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
10. Controlling dimension: INCH.
11. The basic lead spacing is 0.050 inch (1.27mm) between center lines. Each lead centerline shall be located within ±0.005 inch (0.13mm) of its exact longitudinal position relative to lead 1 and the highest numbered (N) lead.

Ceramic Metal Seal Flatpack Packages (Flatpack)



K28.A MIL-STD-1835 CDFP3-F28 (F-11A, CONFIGURATION B)
28 LEAD CERAMIC METAL SEAL FLATPACK PACKAGE

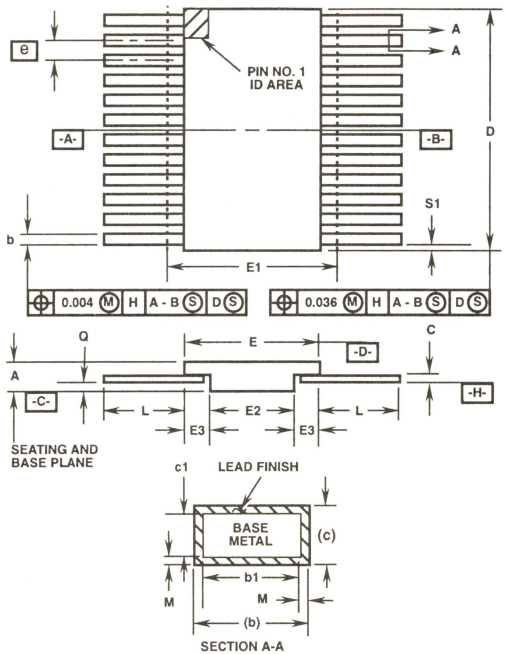
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.045	0.115	1.14	2.92	-
b	0.015	0.022	0.38	0.56	-
b1	0.015	0.019	0.38	0.48	-
c	0.004	0.009	0.10	0.23	-
c1	0.004	0.006	0.10	0.15	-
D	-	0.740	-	18.80	3
E	0.460	0.520	11.68	13.21	-
E1	-	0.550	-	13.97	3
E2	0.180	-	4.57	-	-
E3	0.030	-	0.76	-	7
e	0.050 BSC		1.27 BSC		-
k	0.008	0.015	0.20	0.38	2
L	0.250	0.370	6.35	9.40	-
Q	0.026	0.045	0.66	1.14	8
S1	0.00	-	0.00	-	6
M	-	0.0015	-	0.04	-
N	28		28		-

Rev. 0 5/18/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark. Alternately, a tab (dimension k) may be used to identify pin one.
2. If a pin one identification mark is used in addition to a tab, the limits of dimension k do not apply.
3. This dimension allows for off-center lid, meniscus, and glass overrun.
4. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
5. N is the maximum number of terminal positions.
6. Measure dimension S1 at all four corners.
7. For bottom-brazed lead packages, no organic or polymeric materials shall be molded to the bottom of the package to cover the leads.
8. Dimension Q shall be measured at the point of exit (beyond the meniscus) of the lead from the body. Dimension Q minimum shall be reduced by 0.0015 inch (0.038mm) maximum when solder dip lead finish is applied.
9. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
10. Controlling dimension: INCH.

Ceramic Metal Seal Flatpack Packages (Flatpack)



K28.B

28 LEAD CERAMIC METAL SEAL FLATPACK PACKAGE

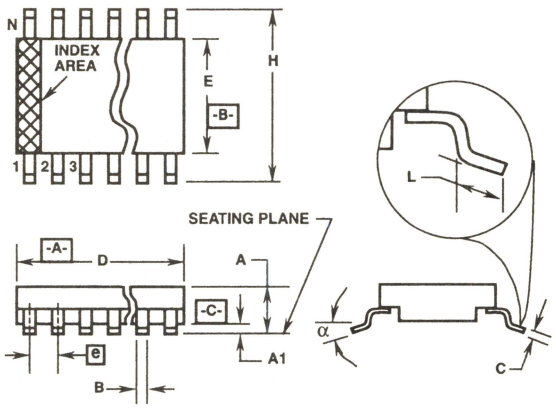
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.045	0.125	1.14	3.18	-
b	0.015	0.022	0.38	0.56	-
b1	0.015	0.019	0.38	0.48	-
c	0.004	0.009	0.10	0.23	-
c1	0.004	0.006	0.10	0.15	-
D	-	0.740	-	18.80	3
E	0.460	0.520	11.68	13.21	-
E1	-	0.550	-	13.97	3
E2	0.180	-	4.57	-	-
E3	0.030	-	0.76	-	7
e	0.050 BSC		1.27 BSC		-
k	0.008	0.015	0.20	0.38	2
L	0.250	0.370	6.35	9.40	-
Q	0.026	0.045	0.66	1.14	8
S1	0.00	-	0.00	-	6
M	-	0.0015	-	0.04	-
N	28		28		-

Rev. 0 10/28/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark. Alternately, a tab (dimension k) may be used to identify pin one.
2. If a pin one identification mark is used in addition to a tab, the limits of dimension k do not apply.
3. This dimension allows for off-center lid, meniscus, and glass overrun.
4. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
5. N is the maximum number of terminal positions.
6. Measure dimension S1 at all four corners.
7. For bottom-brazed lead packages, no organic or polymeric materials shall be molded to the bottom of the package to cover the leads.
8. Dimension Q shall be measured at the point of exit (beyond the meniscus) of the lead from the body. Dimension Q minimum shall be reduced by 0.0015 inch (0.038mm) maximum when solder dip lead finish is applied.
9. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
10. Controlling dimension: INCH.

Ceramic SOIC Flatpack Packages (SOIC Flatpack)



K28.E

28 LEAD CERAMIC SOIC FLATPACK PACKAGE

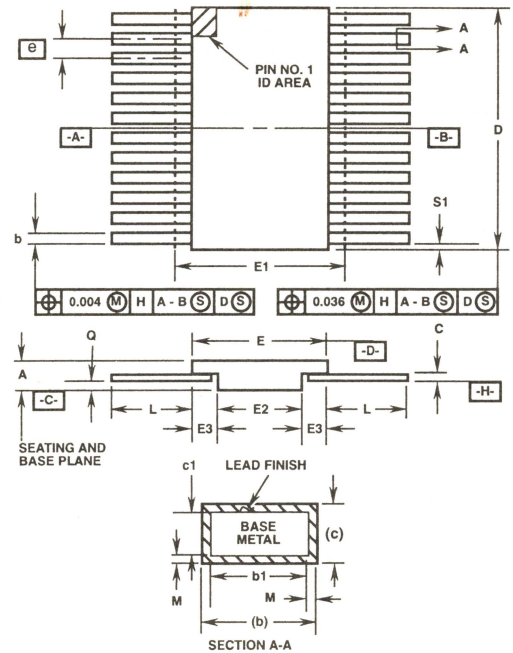
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.092	0.154	2.35	3.90	-
A1	0.004	0.018	0.10	0.45	-
B	0.013	0.020	0.33	0.51	5
C	0.006	0.013	0.15	0.32	-
D	0.697	0.720	17.70	18.30	-
E	0.289	0.301	7.35	7.65	-
e	0.05 BSC		1.27 BSC		-
H	0.393	0.420	10.00	10.65	-
L	0.015	0.050	0.40	1.27	2
N	28		28		3
α	0^o	8^o	0^o	8^o	-

Rev. 0 4/94

NOTES:

1. Dimensioning and tolerancing per ANSI Y14.5M-1982.
2. "L" is the length of terminal for soldering to a substrate.
3. "N" is the number of terminal positions.
4. Terminal numbers are shown for reference only.
5. The lead width "B", as measured 0.36mm (0.014 inch) or greater above the seating plane, shall not exceed a maximum value of 0.61mm (0.024 inch)
6. Controlling dimension: MILLIMETER.

Ceramic Metal Seal Flatpack Packages (Flatpack)



K36.A
36 LEAD CERAMIC METAL SEAL FLATPACK PACKAGE

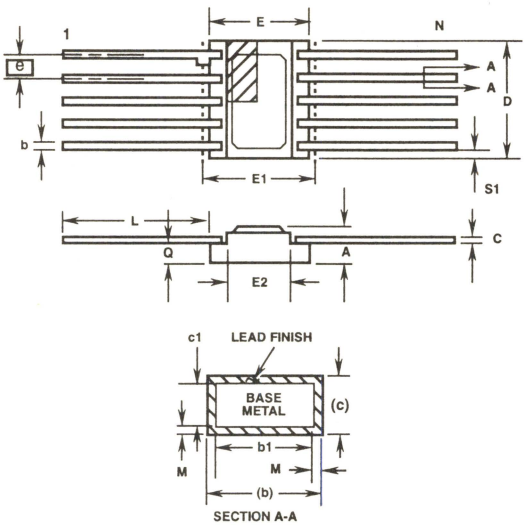
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.138	-	3.51	-
b	0.006	0.013	0.15	0.33	-
b1	0.006	0.010	0.15	0.25	-
c	0.004	0.011	0.10	0.28	-
c1	0.004	0.008	0.10	0.20	-
D	0.620	0.640	15.75	16.26	3
E	0.620	0.640	15.75	8.64	-
E1	-	0.660	-	16.76	3
E2	0.470	0.490	11.94	12.45	-
E3	0.030	-	0.76	-	7
e	0.025 BSC		0.64 BSC		-
k	-	-	-	-	-
L	0.240	0.280	6.10	7.11	-
Q	0.026	0.045	0.66	1.14	8
S1	-	-	-	-	-
M	-	0.0015	-	0.04	-
N	36		36		-

Rev. 0 5/18/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark. Alternately, a tab (dimension k) may be used to identify pin one.
2. If a pin one identification mark is used in addition to a tab, the limits of dimension k do not apply.
3. This dimension allows for off-center lid, meniscus, and glass overrun.
4. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
5. N is the maximum number of terminal positions.
6. Measure dimension S1 at all four corners.
7. For bottom-brazed lead packages, no organic or polymeric materials shall be molded to the bottom of the package to cover the leads.
8. Dimension Q shall be measured at the point of exit (beyond the meniscus) of the lead from the body. Dimension Q minimum shall be reduced by 0.0015 inch (0.038mm) maximum when solder dip lead finish is applied.
9. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
10. Controlling dimension: INCH.

Ceramic Metal Seal Flatpack Packages (Flatpack)



K42.A TOP BRAZED
42 LEAD CERAMIC METAL SEAL FLATPACK PACKAGE

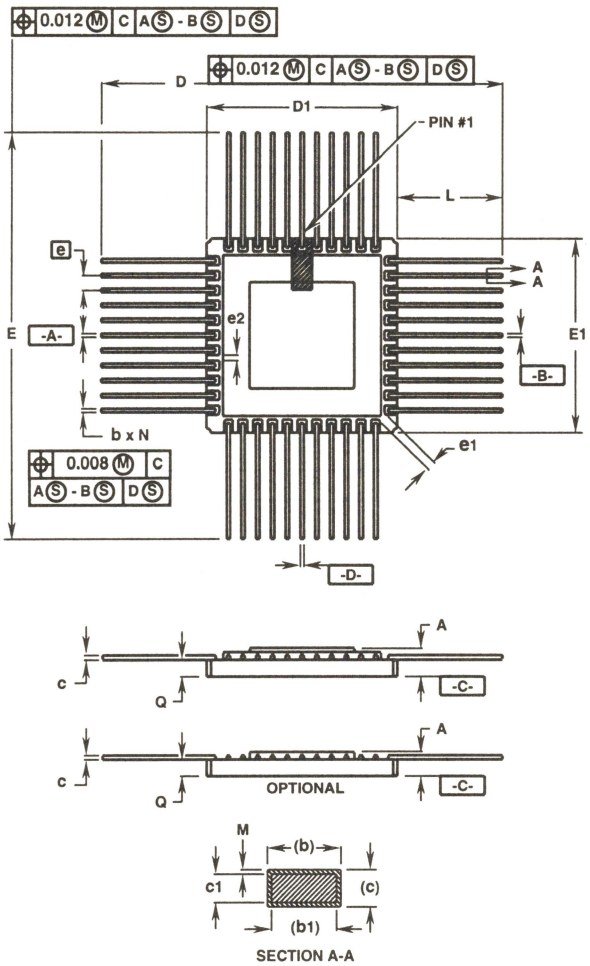
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.100	-	2.54	-
b	0.017	0.025	0.43	0.64	-
b1	0.017	0.023	0.43	0.58	-
c	0.007	0.013	0.18	0.33	-
c1	0.007	0.010	0.18	0.25	-
D	1.045	1.075	26.54	27.31	3
E	0.630	0.650	16.00	16.51	-
E1	-	0.680	-	17.27	3
E2	0.530	0.550	13.46	13.97	-
e	0.050 BSC		1.27 BSC		11
k	-	-	-	-	-
L	0.320	0.350	8.13	8.89	-
Q	0.045	0.065	1.14	1.65	8
S1	0.000	-	0.00	-	6
M	-	0.0015	-	0.04	-
N	42		42		-

Rev. 0 6/17/94

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark. Alternately, a tab (dimension k) may be used to identify pin one.
2. If a pin one identification mark is used in addition to a tab, the limits of dimension k do not apply.
3. This dimension allows for off-center lid, meniscus, and glass overrun.
4. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
5. N is the maximum number of terminal positions.
6. Measure dimension S1 at all four corners.
7. For bottom-brazed lead packages, no organic or polymeric materials shall be molded to the bottom of the package to cover the leads.
8. Dimension Q shall be measured at the point of exit (beyond the meniscus) of the lead from the body. Dimension Q minimum shall be reduced by 0.0015 inch (0.038mm) maximum when solder dip lead finish is applied.
9. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
10. Controlling dimension: INCH.
11. The basic lead spacing is 0.050 inch (1.27mm) between center lines. Each lead centerline shall be located within ±0.005 inch (0.13mm) of its exact longitudinal position relative to lead 1 and the highest numbered (N) lead.

Ceramic Quad Flatpack (CQFP)



R84.A

84 LEAD CERAMIC QUAD FLATPACK PACKAGE

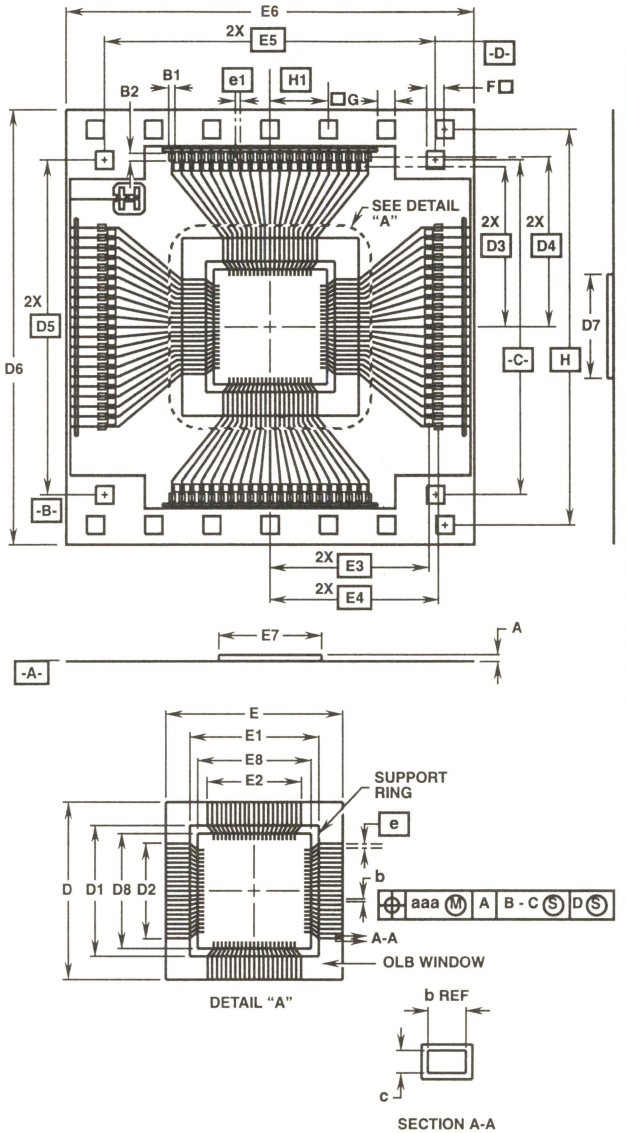
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.105	-	2.67	-
b	0.015	0.022	0.38	0.56	2
b1	0.015	0.019	0.38	0.48	2
c	0.008	0.015	0.20	0.38	2
c1	0.008	0.012	0.20	0.30	2
D	1.800	2.000	45.72	50.80	-
E	1.800	2.000	45.72	50.80	-
D1	1.135	1.170	28.83	29.72	-
E1	1.135	1.170	28.83	29.72	-
e	0.050 BSC		1.27 BSC		-
e1	0.012	-	0.30	-	4
e2	0.012	-	0.30	-	-
L	0.320	0.450	8.13	11.43	-
Q	0.070	0.090	1.78	2.29	6
M	-	0.0015	-	0.04	2
N	84		84		3

Rev. 0 2/21/95

NOTES:

1. Index area: A notch or a pin one identification mark shall be located adjacent to pin one and shall be located within the shaded area shown. The manufacturer's identification shall not be used as a pin one identification mark.
2. Dimensions b1 and c1 apply to lead base metal only. Dimension M applies to lead plating and finish thickness. The maximum limits of lead dimensions b and c or M shall be measured at the centroid of the finished lead surfaces, when solder dip or tin plate lead finish is applied.
3. N is the maximum number of terminal positions.
4. Measure dimension e1 at all four corners.
5. For bottom-brazed lead packages, no organic or polymeric materials shall be molded to the bottom of the package to cover the leads.
6. Dimension Q shall be measured at the point of exit (beyond the meniscus) of the lead from the body. Dimension Q minimum shall be reduced by 0.0015 inch (0.038mm) maximum-when solder dip lead finish is applied.
7. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
8. Controlling dimension: Inch.

Tape Automated Bonding Packages (TAB)



S84.A

84 LEAD TAPE AUTOMATED BONDING PACKAGE

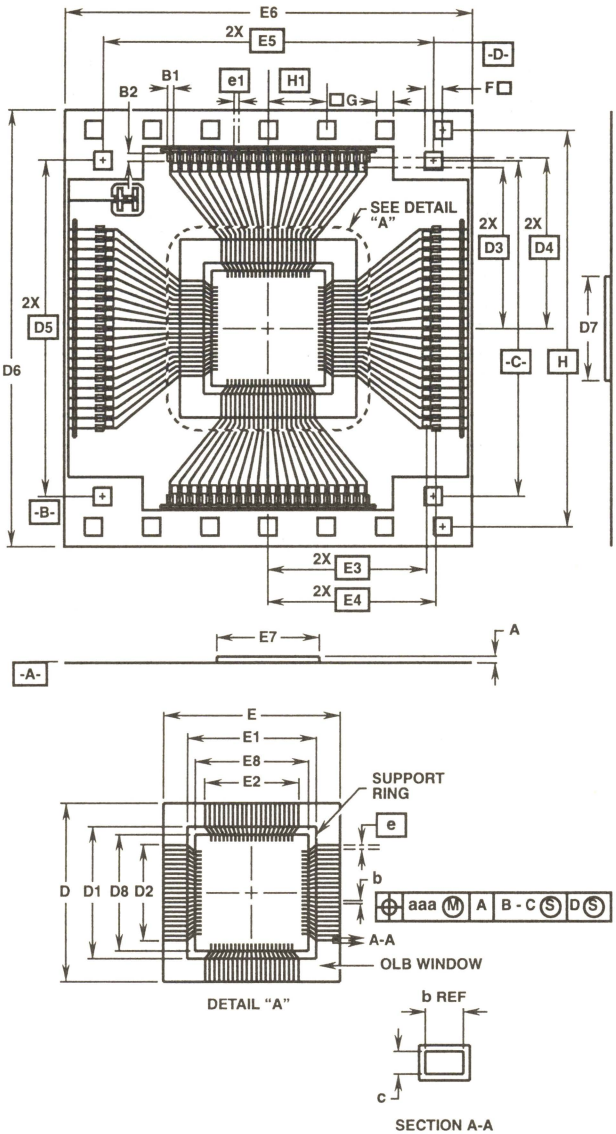
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.034	-	0.86	-
b	0.002	0.004	0.05	0.10	2, 7
c	0.0010	0.0018	0.025	0.046	2, 7
B1	0.019	0.021	0.47	0.53	5
B2	0.023	0.028	0.60	0.70	5
D	0.559	0.569	14.20	14.45	-
E	0.562	0.572	14.27	14.53	-
D1	0.410	0.420	10.41	10.67	3
E1	0.409	0.419	10.39	10.64	3
D2	0.300	0.310	7.62	7.87	4
E2	0.300	0.310	7.62	7.87	4
D3/E3	0.500 BSC		12.70 BSC		-
D4/E4	0.531 BSC		13.475 BSC		-
D5/E5	1.061 BSC		26.95 BSC		-
D6	1.372	1.382	34.85	35.10	-
E6	1.244	1.314	31.62	33.37	-
D7	0.345	0.351	8.77	8.92	-
E7	0.344	0.350	8.74	8.89	-
D8	0.360	0.370	9.14	9.40	-
E8	0.358	0.368	9.09	9.35	-
e	0.015 BSC		0.38 BSC		2
e1	0.016 BSC		0.40 BSC		5
F	0.054	0.057	1.39	1.45	-
G	0.055	0.057	1.40	1.45	-
H	1.253 BSC		31.83 BSC		-
H1	0.187 BSC		4.75 BSC		-
aaa	0.003		0.08		-

Rev. 0 4/94

NOTES:

1. All dimensioning and tolerancing per ANSI Y14.5M-1982.
2. Controlling dimension is MILLIMETERS except for dimensions b, c and e which are in INCHES.
3. Dimensions D1/E1 define the package "body size".
4. Dimensions D2/E2 define the maximum allowable dimension between the outside edges of the outermost leads. This dimension provides necessary clearance from the OLB window corners for excise operations.
5. This dimension applies to all test pads.
6. All lead and test pad arrays shall be arranged in a symmetric configuration with respect to datums D or B-C.
7. Dimensions b and c apply to base material only.
8. Lead Material: Copper
   Lead Finish: Gold over nickel underplate
9. Film format and test pads per JEDEC US-001, Ax - 2x.
10. TAB packages shipped in slide carriers per JEDEC CS-006 with the leads unformed (flat).

Tape Automated Bonding Packages (TAB)



S156.A

156 LEAD TAPE AUTOMATED BONDING PACKAGE

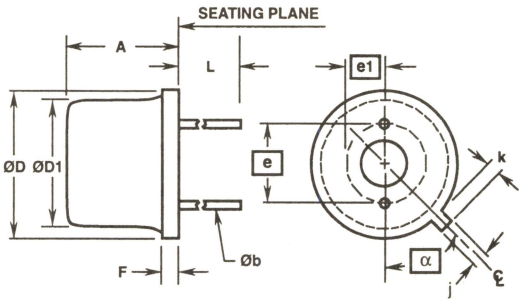
SYMBOL	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX	NOTES
A	-	0.034	-	0.86	-
b	0.002	0.004	0.05	0.10	2
c	0.0010	0.0018	0.025	0.046	2, 7
B1	0.019	0.021	0.47	0.53	5
B2	0.023	0.028	0.60	0.70	5
D	0.559	0.569	14.20	14.45	-
E	0.562	0.572	14.27	14.53	-
D1	0.429	0.439	10.90	11.15	3
E1	0.431	0.441	10.95	11.20	3
D2	0.380	0.390	9.65	9.90	4
E2	0.380	0.390	9.65	9.90	4
D3/E3	0.500 BSC		12.70 BSC		-
D4/E4	0.531 BSC		13.475 BSC		-
D5/E5	1.061 BSC		26.95 BSC		-
D6	1.372	1.382	34.85	35.10	-
E6	1.244	1.314	31.62	33.37	-
D7	0.349	0.355	8.87	9.02	-
E7	0.346	0.352	8.79	8.94	-
D8	0.360	0.370	9.14	9.40	-
E8	0.367	0.377	9.32	9.57	-
e	0.010 BSC		0.254 BSC		2
e1	0.016 BSC		0.40 BSC		5
F	0.054	0.057	1.39	1.45	-
G	0.055	0.057	1.40	1.45	-
H	1.253 BSC		31.83 BSC		-
H1	0.187 BSC		4.75 BSC		-
aaa	0.002		0.05		-

Rev. 0 4/94

NOTES:

1. All dimensioning and tolerancing per ANSI Y14.5M-1982.
2. Controlling dimension is MILLIMETERS except for dimensions b, c and e which are in INCHES.
3. Dimensions D1/E1 define the package "body size".
4. Dimensions D2/E2 define the maximum allowable dimension between the outside edges of the outermost leads. This dimension provides necessary clearance from the OLB window corners for excise operations.
5. This dimension applies to all test pads.
6. All lead and test pad arrays shall be arranged in a symmetric configuration with respect to datums D or B-C.
7. Dimensions b and c apply to base material only.
8. Lead Material: Copper
   Lead Finish: Gold over nickel underplate
9. Film format and test pads per JEDEC US-001, Ax - 2x.
10. TAB packages shipped in slide carriers per JEDEC CS-006 with the leads unformed (flat).

Metal Can Packages (Can)



NOTES:

1. Measured from maximum diameter of the actual device.
2. Measured from tab centerline.
3. N is number of leads.
4. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
5. Controlling dimension: INCH.

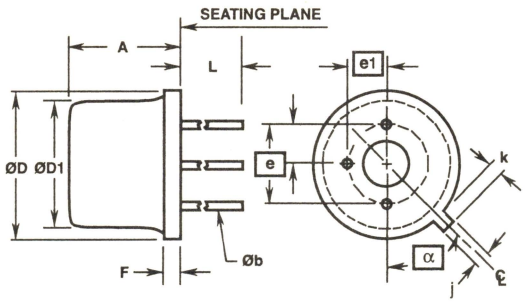
T2.A

2 LEAD METAL CAN PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.130	0.150	3.30	3.81	-
b	0.016	0.019	0.41	0.48	-
D	0.205	0.22	5.21	5.59	-
D1	0.180	0.190	4.57	4.83	-
F	0.010	0.025	0.25	0.64	-
k	0.033	0.046	0.84	1.17	1
j	0.033	0.045	0.84	1.14	-
L	0.500	0.560	12.70	14.22	-
e	0.100 BSC		2.54 BSC		-
e1	-		-		-
α	45		45		2
N	2		2		3

Rev. 0 4/94

Metal Can Packages (Can)



T3.A

3 LEAD METAL CAN PACKAGE

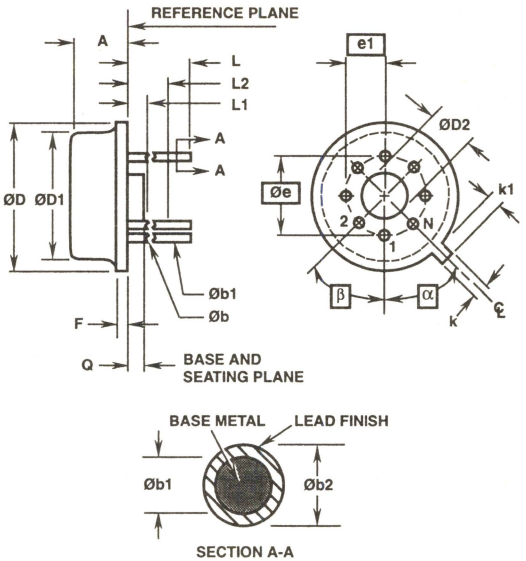
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.130	0.150	3.30	3.81	-
b	0.016	0.019	0.41	0.48	-
D	0.205	0.220	5.21	5.59	-
D1	0.180	0.190	4.57	4.83	-
F	0.010	0.025	0.25	0.64	-
k	0.033	0.048	0.84	1.22	1
j	0.036	0.046	0.91	1.17	-
L	0.500	0.560	12.70	14.22	-
e	0.100 BSC		2.54 BSC		-
e1	0.050 BSC		1.27 BSC		-
α	45		45		2
N	3		3		3

Rev. 0 4/94

NOTES:

1. Measured from maximum diameter of the actual device.
2. Measured from tab centerline.
3. N is number of leads
4. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
5. Controlling dimension: INCH.

Metal Can Packages (Can)



T8.C MIL-STD-1835 MACY1-X8 (A1)
8 LEAD METAL CAN PACKAGE

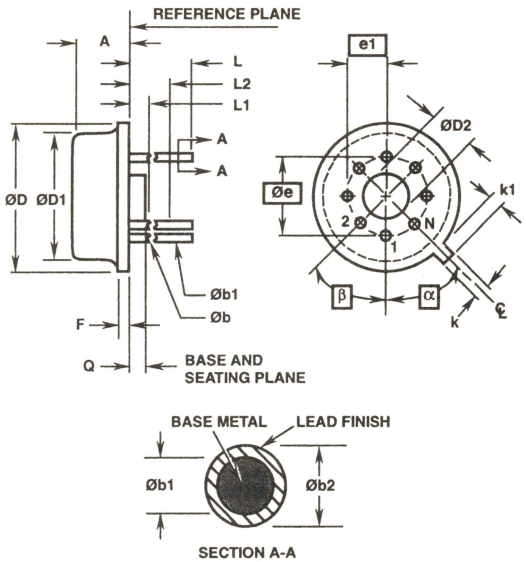
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.165	0.185	4.19	4.70	-
Øb	0.016	0.019	0.41	0.48	1
Øb1	0.016	0.021	0.41	0.53	1
Øb2	0.016	0.024	0.41	0.61	-
ØD	0.335	0.375	8.51	9.40	-
ØD1	0.305	0.335	7.75	8.51	-
ØD2	0.110	0.160	2.79	4.06	-
e	0.200 BSC		5.08 BSC		-
e1	0.100 BSC		2.54 BSC		-
F	-	0.040	-	1.02	-
k	0.027	0.034	0.69	0.86	-
k1	0.027	0.045	0.69	1.14	2
L	0.500	0.750	12.70	19.05	1
L1	-	0.050	-	1.27	1
L2	0.250	-	6.35	-	1
Q	0.010	0.045	0.25	1.14	-
α	45° BSC		45° BSC		3
β	45° BSC		45° BSC		3
N	8		8		4

Rev. 0 5/18/94

NOTES:

1. (All leads) Øb applies between L1 and L2. Øb1 applies between L2 and 0.500 from the reference plane. Diameter is uncontrolled in L1 and beyond 0.500 from the reference plane.
2. Measured from maximum diameter of the product.
3. α is the basic spacing from the centerline of the tab to terminal 1 and β is the basic spacing of each lead or lead position (N -1 places) from α, looking at the bottom of the package.
4. N is the maximum number of terminal positions.
5. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
6. Controlling dimension: INCH.

Metal Can Packages (Can)



T10.B MIL-STD-1835 MACY1-X10 (A2)
10 LEAD METAL CAN PACKAGE

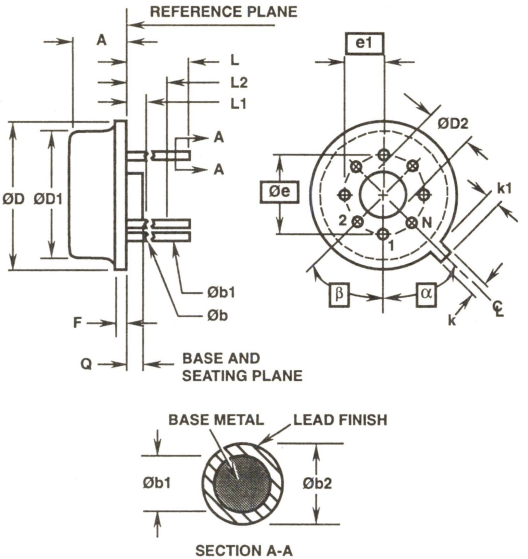
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.165	0.185	4.19	4.70	-
Øb	0.016	0.019	0.41	0.48	1
Øb1	0.016	0.021	0.41	0.53	1
Øb2	0.016	0.024	0.41	0.61	-
ØD	0.335	0.375	8.51	9.52	-
ØD1	0.305	0.335	7.75	8.51	-
ØD2	0.110	0.160	2.79	4.06	-
e	0.230 BSC		5.84 BSC		-
e1	0.115 BSC		2.92 BSC		-
F	-	0.040	-	1.02	-
k	0.027	0.034	0.69	0.86	-
k1	0.027	0.045	0.69	1.14	2
L	0.500	0.750	12.70	19.05	1
L1	-	0.050	-	1.27	1
L2	0.250	-	6.35	-	1
Q	0.010	0.045	0.25	1.14	-
α	36° BSC		36° BSC		3
β	36° BSC		36° BSC		3
N	10		10		4

Rev. 0 5/18/94

NOTES:

1. (All leads) Øb applies between L1 and L2. Øb1 applies between L2 and 0.500 from the reference plane. Diameter is uncontrolled in L1 and beyond 0.500 from the reference plane.
2. Measured from maximum diameter of the product.
3. α is the basic spacing from the centerline of the tab to terminal 1 and β is the basic spacing of each lead or lead position (N -1 places) from α, looking at the bottom of the package.
4. N is the maximum number of terminal positions.
5. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
6. Controlling dimension: INCH.

Metal Can Packages (Can)



T10.C

10 LEAD METAL CAN PACKAGE

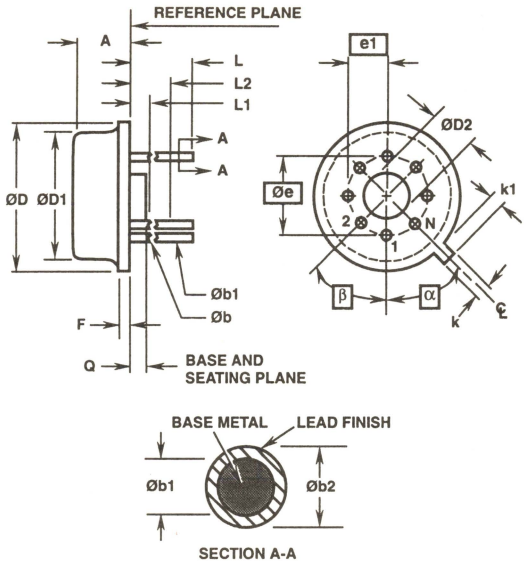
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.165	0.185	4.19	4.70	-
øb	0.016	0.019	0.41	0.48	1
Øb1	0.016	0.021	0.41	0.53	1
Øb2	0.016	0.024	0.41	0.61	-
ØD	0.335	0.375	8.51	9.40	-
ØD1	0.305	0.335	7.75	8.51	-
ØD2	-	-	-	-	-
e	0.230 BSC		5.84 BSC		-
e1	0.115 BSC		2.92 BSC		-
F	-	0.040	-	1.02	-
k	0.027	0.034	0.69	0.86	-
k1	0.027	0.045	0.69	1.14	2
L	0.500	0.750	12.70	19.05	1
L1	-	0.050	-	1.27	1
L2	0.250	-	6.35	-	1
Q	-	-	-	-	-
α	36^{o} BSC		36^{o} BSC		3
β	36^{o} BSC		36^{o} BSC		3
N	10		10		4

Rev. 0 5/18/94

NOTES:

1. (All leads) Øb applies between L1 and L2. Øb1 applies between L2 and 0.500 from the reference plane. Diameter is uncontrolled in L1 and beyond 0.500 from the reference plane.
2. Measured from maximum diameter of the product.
3. α is the basic spacing from the centerline of the tab to terminal 1 and β is the basic spacing of each lead or lead position (N -1 places) from α, looking at the bottom of the package.
4. N is the maximum number of terminal positions.
5. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
6. Controlling dimension: INCH.

Metal Can Packages (Can)



T12.B

12 LEAD METAL CAN PACKAGE

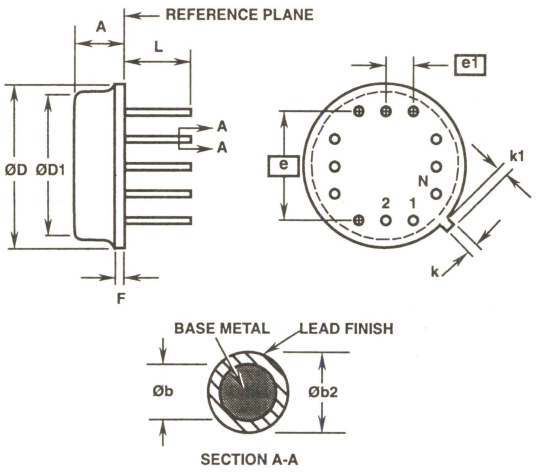
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.165	0.185	4.19	4.70	-
Øb	0.016	0.019	0.41	0.48	1
Øb1	0.016	0.021	0.41	0.53	1
Øb2	0.016	0.024	0.41	0.61	-
ØD	0.335	0.375	8.51	9.40	-
ØD1	0.305	0.335	7.75	8.51	-
ØD2	-	-	-	-	-
e	0.230 BSC		5.84 BSC		-
e1	0.115 BSC		2.92 BSC		-
F	-	0.040	-	1.02	-
k	0.027	0.034	0.69	0.86	-
k1	0.027	0.045	0.69	1.14	2
L	0.500	0.750	12.70	19.05	1
L1	-	0.050	-	1.27	1
L2	0.250	-	6.35	-	1
Q	-	-	-	-	-
α	30^{o} BSC		30^{o} BSC		3
β	30^{o} BSC		30^{o} BSC		3
N	12		12		4

Rev. 0 5/18/94

NOTES:

1. (All leads) Øb applies between L1 and L2. Øb1 applies between L2 and 0.500 from the reference plane. Diameter is uncontrolled in L1 and beyond 0.500 from the reference plane.
2. Measured from maximum diameter of the product.
3. α is the basic spacing from the centerline of the tab to terminal 1 and β is the basic spacing of each lead or lead position (N -1 places) from α, looking at the bottom of the package.
4. N is the maximum number of terminal positions.
5. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
6. Controlling dimension: INCH.

Metal Can Packages (Can)



T12.C

12 LEAD METAL CAN PACKAGE

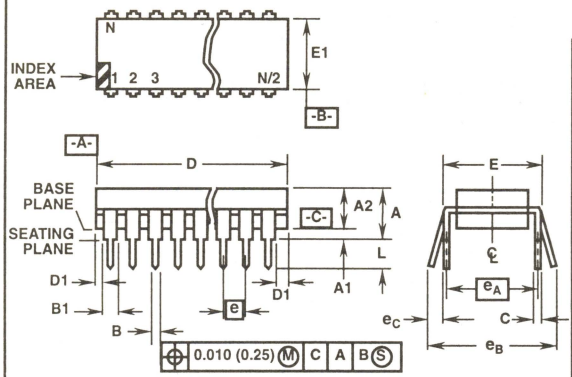
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.130	0.150	3.30	3.81	-
Øb	0.016	0.019	0.41	0.48	-
Øb2	0.016	0.021	0.41	0.53	-
ØD	0.585	0.615	14.86	15.62	-
ØD1	0.540	0.560	13.72	14.22	-
e	0.400 BSC		10.16 BSC		-
e1	0.100 BSC		2.54 BSC		-
F	0.020	0.040	0.51	1.02	-
k	0.027	0.034	0.69	0.86	-
k1	0.027	0.045	0.69	1.14	2
L	0.500	0.560	12.70	14.22	-
N	12		12		3

Rev. 0 5/18/94

NOTES:

1. The reference, base, and seating planes are the same for this variation.
2. Measured from maximum diameter of the product.
3. N is the maximum number of terminal positions.
4. Dimensioning and tolerancing per ANSI Y14.5M - 1982.
5. Controlling dimension: INCH.

Dual-In-Line Plastic Packages (PDIP)



E8.3 (JEDEC MS-001-BA ISSUE D)
8 LEAD DUAL-IN-LINE PLASTIC PACKAGE

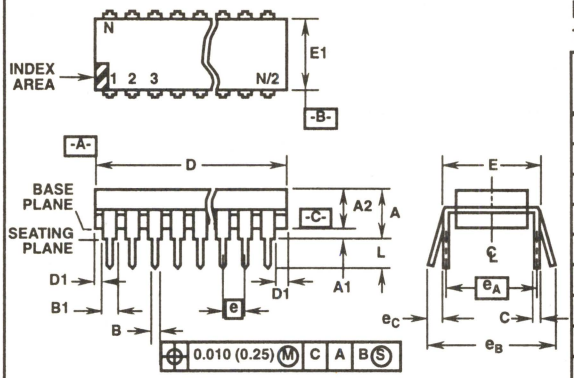
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.210	-	5.33	4
A1	0.015	-	0.39	-	4
A2	0.115	0.195	2.93	4.95	-
B	0.014	0.022	0.356	0.558	-
B1	0.045	0.070	1.15	1.77	8, 10
C	0.008	0.014	0.204	0.355	-
D	0.355	0.400	9.01	10.16	5
D1	0.005	-	0.13	-	5
E	0.300	0.325	7.62	8.25	6
E1	0.240	0.280	6.10	7.11	5
e	0.100 BSC		2.54 BSC		-
e_A	0.300 BSC		7.62 BSC		6
e_B	-	0.430	-	10.92	7
L	0.115	0.150	2.93	3.81	4
N	8		8		9

Rev. 0 12/93

NOTES:

1. Controlling Dimensions: INCH. In case of conflict between English and Metric dimensions, the inch dimensions control.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication No. 95.
4. Dimensions A, A1 and L are measured with the package seated in JEDEC seating plane gauge GS-3.
5. D, D1, and E1 dimensions do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.010 inch (0.25mm).
6. E and e_A are measured with the leads constrained to be perpendicular to datum -C-.
7. e_B and e_C are measured at the lead tips with the leads unconstrained. e_C must be zero or greater.
8. B1 maximum dimensions do not include dambar protrusions. Dambar protrusions shall not exceed 0.010 inch (0.25mm).
9. N is the maximum number of terminal positions.
10. Corner leads (1, N, N/2 and N/2 + 1) for E8.3, E16.3, E18.3, E28.3, E42.6 will have a B1 dimension of 0.030 - 0.045 inch (0.76 - 1.14mm).

Dual-In-Line Plastic Packages (PDIP)



E14.3 (JEDEC MS-001-AA ISSUE D)
14 LEAD DUAL-IN-LINE PLASTIC PACKAGE

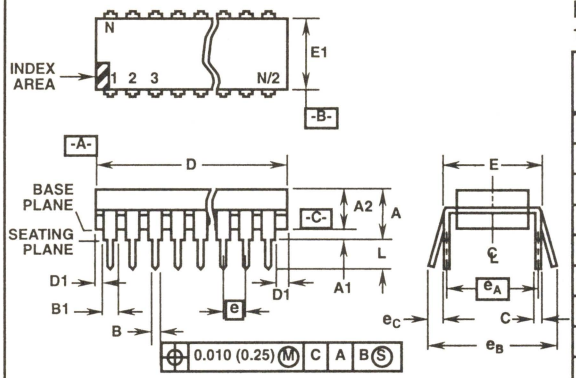
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.210	-	5.33	4
A1	0.015	-	0.39	-	4
A2	0.115	0.195	2.93	4.95	-
B	0.014	0.022	0.356	0.558	-
B1	0.045	0.070	1.15	1.77	8
C	0.008	0.014	0.204	0.355	-
D	0.735	0.775	18.66	19.68	5
D1	0.005	-	0.13	-	5
E	0.300	0.325	7.62	8.25	6
E1	0.240	0.280	6.10	7.11	5
e	0.100 BSC		2.54 BSC		-
e_A	0.300 BSC		7.62 BSC		6
e_B	-	0.430	-	10.92	7
L	0.115	0.150	2.93	3.81	4
N	14		14		9

Rev. 0 12/93

NOTES:

1. Controlling Dimensions: INCH. In case of conflict between English and Metric dimensions, the inch dimensions control.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication No. 95.
4. Dimensions A, A1 and L are measured with the package seated in JEDEC seating plane gauge GS-3.
5. D, D1, and E1 dimensions do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.010 inch (0.25mm).
6. E and e_A are measured with the leads constrained to be perpendicular to datum -C-.
7. e_B and e_C are measured at the lead tips with the leads unconstrained. e_C must be zero or greater.
8. B1 maximum dimensions do not include dambar protrusions. Dambar protrusions shall not exceed 0.010 inch (0.25mm).
9. N is the maximum number of terminal positions.
10. Corner leads (1, N, N/2 and N/2 + 1) for E8.3, E16.3, E18.3, E28.3, E42.6 will have a B1 dimension of 0.030 - 0.045 inch (0.76 - 1.14mm).

Dual-In-Line Plastic Packages (PDIP)



E16.3 (JEDEC MS-001-BB ISSUE D)
16 LEAD DUAL-IN-LINE PLASTIC PACKAGE

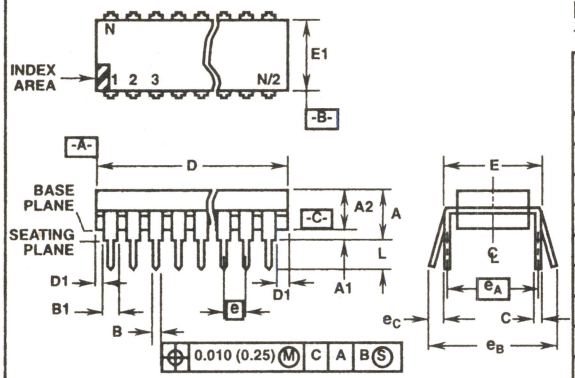
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.210	-	5.33	4
A1	0.015	-	0.39	-	4
A2	0.115	0.195	2.93	4.95	-
B	0.014	0.022	0.356	0.558	-
B1	0.045	0.070	1.15	1.77	8, 10
C	0.008	0.014	0.204	0.355	-
D	0.735	0.775	18.66	19.68	5
D1	0.005	-	0.13	-	5
E	0.300	0.325	7.62	8.25	6
E1	0.240	0.280	6.10	7.11	5
e	0.100 BSC		2.54 BSC		-
e_A	0.300 BSC		7.62 BSC		6
e_B	-	0.430	-	10.92	7
L	0.115	0.150	2.93	3.81	4
N	16		16		9

Rev. 0 12/93

NOTES:

1. Controlling Dimensions: INCH. In case of conflict between English and Metric dimensions, the inch dimensions control.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication No. 95.
4. Dimensions A, A1 and L are measured with the package seated in JEDEC seating plane gauge GS-3.
5. D, D1, and E1 dimensions do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.010 inch (0.25mm).
6. E and e_A are measured with the leads constrained to be perpendicular to datum -C-.
7. e_B and e_C are measured at the lead tips with the leads unconstrained. e_C must be zero or greater.
8. B1 maximum dimensions do not include dambar protrusions. Dambar protrusions shall not exceed 0.010 inch (0.25mm).
9. N is the maximum number of terminal positions.
10. Corner leads (1, N, N/2 and N/2 + 1) for E8.3, E16.3, E18.3, E28.3, E42.6 will have a B1 dimension of 0.030 - 0.045 inch (0.76 - 1.14mm).

Dual-In-Line Plastic Packages (PDIP)



E18.3 (JEDEC MS-001-BC ISSUE D)
18 LEAD DUAL-IN-LINE PLASTIC PACKAGE

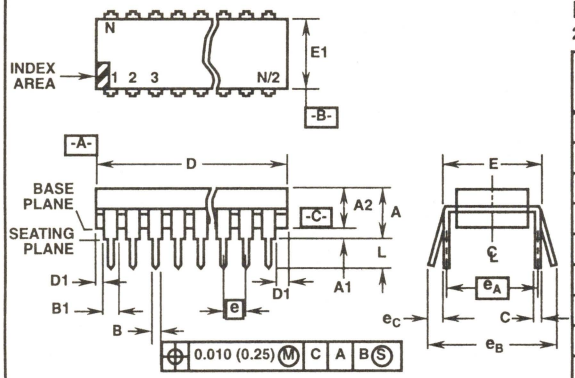
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.210	-	5.33	4
A1	0.015	-	0.39	-	4
A2	0.115	0.195	2.93	4.95	-
B	0.014	0.022	0.356	0.558	-
B1	0.045	0.070	1.15	1.77	8, 10
C	0.008	0.014	0.204	0.355	-
D	0.845	0.880	21.47	22.35	5
D1	0.005	-	0.13	-	5
E	0.300	0.325	7.62	8.25	6
E1	0.240	0.280	6.10	7.11	5
e	0.100 BSC		2.54 BSC		-
e_A	0.300 BSC		7.62 BSC		6
e_B	-	0.430	-	10.92	7
L	0.115	0.150	2.93	3.81	4
N	18		18		9

Rev. 0 12/93

NOTES:

1. Controlling Dimensions: INCH. In case of conflict between English and Metric dimensions, the inch dimensions control.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication No. 95.
4. Dimensions A, A1 and L are measured with the package seated in JEDEC seating plane gauge GS-3.
5. D, D1, and E1 dimensions do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.010 inch (0.25mm).
6. E and e_A are measured with the leads constrained to be perpendicular to datum -C-.
7. e_B and e_C are measured at the lead tips with the leads unconstrained. e_C must be zero or greater.
8. B1 maximum dimensions do not include dambar protrusions. Dambar protrusions shall not exceed 0.010 inch (0.25mm).
9. N is the maximum number of terminal positions.
10. Corner leads (1, N, N/2 and N/2 + 1) for E8.3, E16.3, E18.3, E28.3, E42.6 will have a B1 dimension of 0.030 - 0.045 inch (0.76 - 1.14mm).

Dual-In-Line Plastic Packages (PDIP)



E20.3 (JEDEC MS-001-AD ISSUE D)
20 LEAD DUAL-IN-LINE PLASTIC PACKAGE

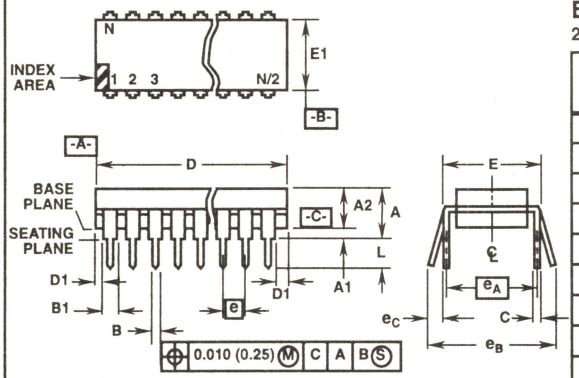
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.210	-	5.33	4
A1	0.015	-	0.39	-	4
A2	0.115	0.195	2.93	4.95	-
B	0.014	0.022	0.356	0.558	-
B1	0.045	0.070	1.55	1.77	8
C	0.008	0.014	0.204	0.355	-
D	0.980	1.060	24.89	26.9	5
D1	0.005	-	0.13	-	5
E	0.300	0.325	7.62	8.25	6
E1	0.240	0.280	6.10	7.11	5
e	0.100 BSC		2.54 BSC		-
e_A	0.300 BSC		7.62 BSC		6
e_B	-	0.430	-	10.92	7
L	0.115	0.150	2.93	3.81	4
N	20		20		9

Rev. 0 12/93

NOTES:

1. Controlling Dimensions: INCH. In case of conflict between English and Metric dimensions, the inch dimensions control.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication No. 95.
4. Dimensions A, A1 and L are measured with the package seated in JEDEC seating plane gauge GS-3.
5. D, D1, and E1 dimensions do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.010 inch (0.25mm).
6. E and e_A are measured with the leads constrained to be perpendicular to datum -C-.
7. e_B and e_C are measured at the lead tips with the leads unconstrained. e_C must be zero or greater.
8. B1 maximum dimensions do not include dambar protrusions. Dambar protrusions shall not exceed 0.010 inch (0.25mm).
9. N is the maximum number of terminal positions.
10. Corner leads (1, N, N/2 and N/2 + 1) for E8.3, E16.3, E18.3, E28.3, E42.6 will have a B1 dimension of 0.030 - 0.045 inch (0.76 - 1.14mm).

Dual-In-Line Plastic Packages (PDIP)



NOTES:

1. Controlling Dimensions: INCH. In case of conflict between English and Metric dimensions, the inch dimensions control.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication No. 95.
4. Dimensions A, A1 and L are measured with the package seated in JEDEC seating plane gauge GS-3.
5. D, D1, and E1 dimensions do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.010 inch (0.25mm).
6. E and e_A are measured with the leads constrained to be perpendicular to datum -C-.
7. e_B and e_C are measured at the lead tips with the leads unconstrained. e_C must be zero or greater.
8. B1 maximum dimensions do not include dambar protrusions. Dambar protrusions shall not exceed 0.010 inch (0.25mm).
9. N is the maximum number of terminal positions.
10. Corner leads (1, N, N/2 and N/2 + 1) for E8.3, E16.3, E18.3, E28.3, E42.6 will have a B1 dimension of 0.030 - 0.045 inch (0.76 - 1.14mm).

E22.4 (JEDEC MS-010-AA ISSUE C)
22 LEAD DUAL-IN-LINE PLASTIC PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.210	-	5.33	4
A1	0.015	-	0.39	-	4
A2	0.125	0.195	3.18	4.95	-
B	0.014	0.022	0.356	0.558	-
B1	0.045	0.065	1.15	1.65	8
C	0.009	0.015	0.229	0.381	-
D	1.065	1.120	27.06	28.44	5
D1	0.005	-	0.13	-	5
E	0.390	0.425	9.91	10.79	6
E1	0.330	0.390	8.39	9.90	5
e	0.100 BSC		2.54 BSC		-
e_A	0.400 BSC		10.16 BSC		6
e_B	-	0.500	-	12.70	7
L	0.115	0.160	2.93	4.06	4
N	22		22		9

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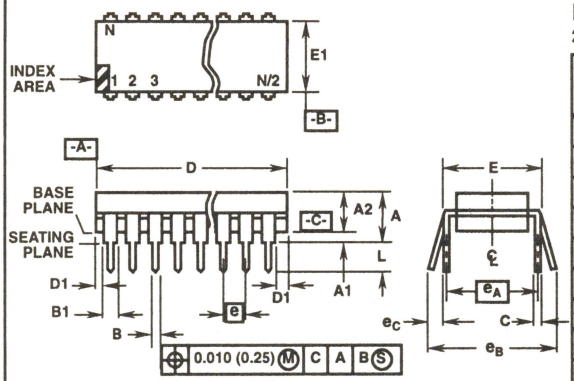
Dual-In-Line Plastic Packages (PDIP)



E24.3 (JEDEC MS-001-AF ISSUE D)
24 LEAD NARROW BODY DUAL-IN-LINE PLASTIC PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.210	-	5.33	4
A1	0.015	-	0.39	-	4
A2	0.115	0.195	2.93	4.95	-
B	0.014	0.022	0.356	0.558	-
B1	0.045	0.070	1.15	1.77	8
C	0.008	0.014	0.204	0.355	-
D	1.230	1.280	31.24	32.51	5
D1	0.005	-	0.13	-	5
E	0.300	0.325	7.62	8.25	6
E1	0.240	0.280	6.10	7.11	5
e	0.100 BSC		2.54 BSC		-
e_A	0.300 BSC		7.62 BSC		6
e_B	-	0.430	-	10.92	7
L	0.115	0.150	2.93	3.81	4
N	24		24		9

Rev. 0 12/93

NOTES:

1. Controlling Dimensions: INCH. In case of conflict between English and Metric dimensions, the inch dimensions control.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication No. 95.
4. Dimensions A, A1 and L are measured with the package seated in JEDEC seating plane gauge GS-3.
5. D, D1, and E1 dimensions do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.010 inch (0.25mm).
6. E and e_A are measured with the leads constrained to be perpendicular to datum -C-.
7. e_B and e_C are measured at the lead tips with the leads unconstrained. e_C must be zero or greater.
8. B1 maximum dimensions do not include dambar protrusions. Dambar protrusions shall not exceed 0.010 inch (0.25mm).
9. N is the maximum number of terminal positions.
10. Corner leads (1, N, N/2 and N/2 + 1) for E8.3, E16.3, E18.3, E28.3, E42.6 will have a B1 dimension of 0.030 - 0.045 inch (0.76 - 1.14mm).

Dual-In-Line Plastic Packages (PDIP)

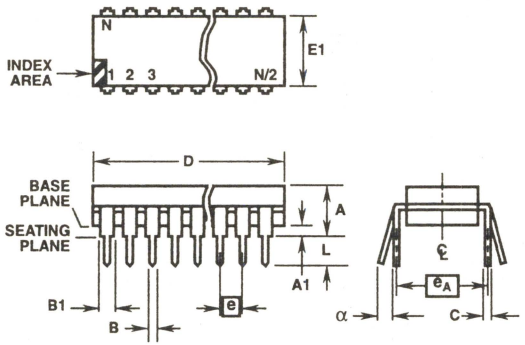


FIGURE 1

E24.4-S

24 LEAD DUAL-IN-LINE PLASTIC PACKAGE (400 MIL)

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.142	0.161	3.60	4.10	2
A1	0.020	-	0.50	-	2
B	0.016	0.023	0.40	0.60	-
B1	0.042	0.053	1.05	1.35	-
C	0.008	0.013	0.20	0.35	-
D	1.185	1.204	30.10	30.60	3
E1	0.331	0.346	8.40	8.80	3
e	0.100 BSC		2.54 BSC		-
e_A	0.400 BSC		10.16 BSC		4
L	0.119	-	3.0	-	2
N	24		24		5
α	0^o	15^o	0^o	15^o	-

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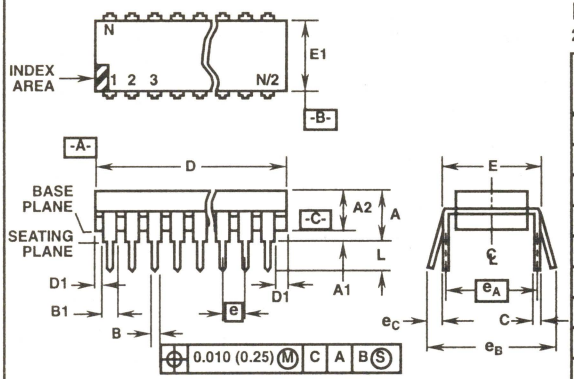
NOTES:

1. Controlling Dimensions: MILLIMETER. In case of conflict between English and Metric dimensions, the metric dimensions control.
2. Dimensions A, A1 and L are measured with the package seated in JEDEC seating plane gauge GS-3.
3. D and E1 dimensions do not include mold flash or protrusions.
4. $\boxed{e_A}$ is measured with the leads constrained to be perpendicular to base plane.
5. N is the maximum number of terminal positions.

Dual-In-Line Plastic Packages (PDIP)



E24.6 (JEDEC MS-011-AA ISSUE B)
24 LEAD DUAL-IN-LINE PLASTIC PACKAGE

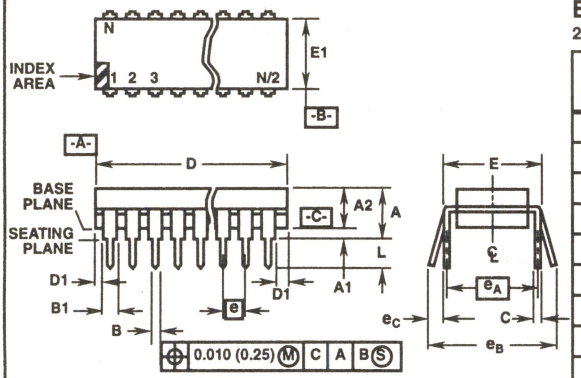
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.250	-	6.35	4
A1	0.015	-	0.39	-	4
A2	0.125	0.195	3.18	4.95	-
B	0.014	0.022	0.356	0.558	-
B1	0.030	0.070	0.77	1.77	8
C	0.008	0.015	0.204	0.381	-
D	1.150	1.290	29.3	32.7	5
D1	0.005	-	0.13	-	5
E	0.600	0.625	15.24	15.87	6
E1	0.485	0.580	12.32	14.73	5
e	0.100 BSC		2.54 BSC		-
e_A	0.600 BSC		15.24 BSC		6
e_B	-	0.700	-	17.78	7
L	0.115	0.200	2.93	5.08	4
N	24		24		9

Rev. 0 12/93

NOTES:

1. Controlling Dimensions: INCH. In case of conflict between English and Metric dimensions, the inch dimensions control.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication No. 95.
4. Dimensions A, A1 and L are measured with the package seated in JEDEC seating plane gauge GS-3.
5. D, D1, and E1 dimensions do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.010 inch (0.25mm).
6. E and e_A are measured with the leads constrained to be perpendicular to datum -C-.
7. e_B and e_C are measured at the lead tips with the leads unconstrained. e_C must be zero or greater.
8. B1 maximum dimensions do not include dambar protrusions. Dambar protrusions shall not exceed 0.010 inch (0.25mm).
9. N is the maximum number of terminal positions.
10. Corner leads (1, N, N/2 and N/2 + 1) for E8.3, E16.3, E18.3, E28.3, E42.6 will have a B1 dimension of 0.030 - 0.045 inch (0.76 - 1.14mm).

Dual-In-Line Plastic Packages (PDIP)



E28.3 (JEDEC MS-001-BF ISSUE D)
28 LEAD NARROW BODY DUAL-IN-LINE PLASTIC PACKAGE

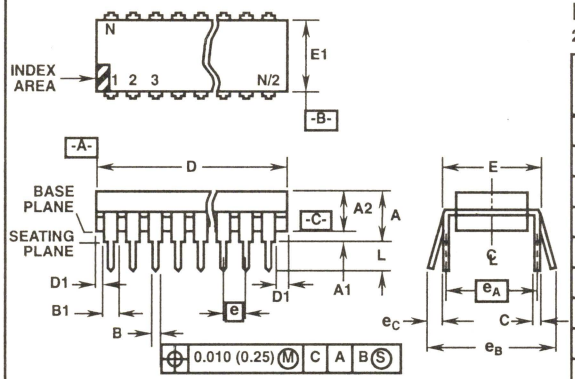
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.210	-	5.33	4
A1	0.015	-	0.39	-	4
A2	0.115	0.195	2.93	4.95	-
B	0.014	0.022	0.356	0.558	-
B1	0.045	0.070	1.15	1.77	8, 10
C	0.008	0.014	0.204	0.355	-
D	1.345	1.400	34.20	35.56	5
D1	0.005	-	0.13	-	5
E	0.300	0.325	7.62	8.25	6
E1	0.240	0.280	6.10	7.11	5
e	0.100 BSC		2.54 BSC		-
e_A	0.300 BSC		7.62 BSC		6
e_B	-	0.430	-	10.92	7
L	0.115	0.150	2.93	3.81	4
N	28		28		9

Rev. 0 12/93

NOTES:

1. Controlling Dimensions: INCH. In case of conflict between English and Metric dimensions, the inch dimensions control.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication No. 95.
4. Dimensions A, A1 and L are measured with the package seated in JEDEC seating plane gauge GS-3.
5. D, D1, and E1 dimensions do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.010 inch (0.25mm).
6. E and e_A are measured with the leads constrained to be perpendicular to datum -C-.
7. e_B and e_C are measured at the lead tips with the leads unconstrained. e_C must be zero or greater.
8. B1 maximum dimensions do not include dambar protrusions. Dambar protrusions shall not exceed 0.010 inch (0.25mm).
9. N is the maximum number of terminal positions.
10. Corner leads (1, N, N/2 and N/2 + 1) for E8.3, E16.3, E18.3, E28.3, E42.6 will have a B1 dimension of 0.030 - 0.045 inch (0.76 - 1.14mm).

Dual-In-Line Plastic Packages (PDIP)



NOTES:

1. Controlling Dimensions: INCH. In case of conflict between English and Metric dimensions, the inch dimensions control.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication No. 95.
4. Dimensions A, A1 and L are measured with the package seated in JEDEC seating plane gauge GS-3.
5. D, D1, and E1 dimensions do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.010 inch (0.25mm).
6. E and e_A are measured with the leads constrained to be perpendicular to datum -C-.
7. e_B and e_C are measured at the lead tips with the leads unconstrained. e_C must be zero or greater.
8. B1 maximum dimensions do not include dambar protrusions. Dambar protrusions shall not exceed 0.010 inch (0.25mm).
9. N is the maximum number of terminal positions.
10. Corner leads (1, N, N/2 and N/2 + 1) for E8.3, E16.3, E18.3, E28.3, E42.6 will have a B1 dimension of 0.030 - 0.045 inch (0.76 - 1.14mm).

E28.6 (JEDEC MS-011-AB ISSUE B)
28 LEAD DUAL-IN-LINE PLASTIC PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.250	-	6.35	4
A1	0.015	-	0.39	-	4
A2	0.125	0.195	3.18	4.95	-
B	0.014	0.022	0.356	0.558	-
B1	0.030	0.070	0.77	1.77	8
C	0.008	0.015	0.204	0.381	-
D	1.380	1.565	35.1	39.7	5
D1	0.005	-	0.13	-	5
E	0.600	0.625	15.24	15.87	6
E1	0.485	0.580	12.32	14.73	5
e	0.100 BSC		2.54 BSC		-
e_A	0.600 BSC		15.24 BSC		6
e_B	-	0.700	-	17.78	7
L	0.115	0.200	2.93	5.08	4
N	28		28		9

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Dual-In-Line Plastic Packages (PDIP)

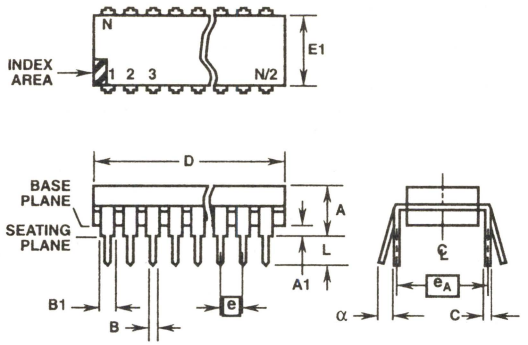


FIGURE 1

E28.6A-S

28 LEAD DUAL-IN-LINE PLASTIC PACKAGE

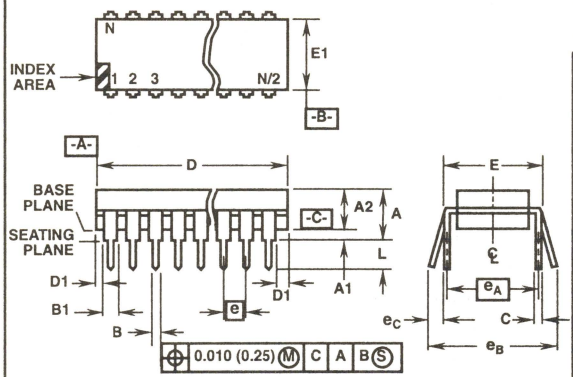
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.178	0.196	4.5	5.0	2
A1	0.020	-	0.50	-	2
B	0.016	0.023	0.40	0.60	-
B1	0.042	0.053	1.05	1.35	-
C	0.008	0.13	0.20	0.35	-
D	1.485	1.503	37.7	38.2	3
E1	0.508	0.523	12.9	13.3	3
e	0.100 BSC		2.54 BSC		-
e_A	0.600 BSC		15.24 BSC		4
L	0.119	-	3.0	-	2
N	28		28		5
α	0^o	15^o	0^o	15^o	-

Rev. 1 4/95

NOTES:

1. Controlling Dimensions: MILLIMETER. In case of conflict between English and Metric dimensions, the metric dimensions control.
2. Dimensions A, A1 and L are measured with the package seated in JEDEC seating plane gauge GS-3.
3. D and E1 dimensions do not include mold flash or protrusions.
4. e_A is measured with the leads constrained to be perpendicular to base plane.
5. N is the maximum number of terminal positions.

Dual-In-Line Plastic Packages (PDIP)



E40.6 (JEDEC MS-011-AC ISSUE B)
40 LEAD DUAL-IN-LINE PLASTIC PACKAGE

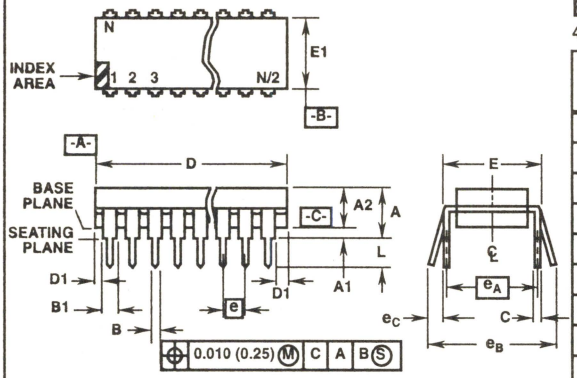
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.250	-	6.35	4
A1	0.015	-	0.39	-	4
A2	0.125	0.195	3.18	4.95	-
B	0.014	0.022	0.356	0.558	-
B1	0.030	0.070	0.77	1.77	8
C	0.008	0.015	0.204	0.381	-
D	1.980	2.095	50.3	53.2	5
D1	0.005	-	0.13	-	5
E	0.600	0.625	15.24	15.87	6
E1	0.485	0.580	12.32	14.73	5
e	0.100 BSC		2.54 BSC		-
e_A	0.600 BSC		15.24 BSC		6
e_B	-	0.700	-	17.78	7
L	0.115	0.200	2.93	5.08	4
N	40		40		9

Rev. 0 12/93

NOTES:

1. Controlling Dimensions: INCH. In case of conflict between English and Metric dimensions, the inch dimensions control.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication No. 95.
4. Dimensions A, A1 and L are measured with the package seated in JEDEC seating plane gauge GS-3.
5. D, D1, and E1 dimensions do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.010 inch (0.25mm).
6. E and e_A are measured with the leads constrained to be perpendicular to datum -C-.
7. e_B and e_C are measured at the lead tips with the leads unconstrained. e_C must be zero or greater.
8. B1 maximum dimensions do not include dambar protrusions. Dambar protrusions shall not exceed 0.010 inch (0.25mm).
9. N is the maximum number of terminal positions.
10. Corner leads (1, N, N/2 and N/2 + 1) for E8.3, E16.3, E18.3, E28.3, E42.6 will have a B1 dimension of 0.030 - 0.045 inch (0.76 - 1.14mm).

Dual-In-Line Plastic Packages (PDIP)



NOTES:

1. Controlling Dimensions: INCH. In case of conflict between English and Metric dimensions, the inch dimensions control.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication No. 95.
4. Dimensions A, A1 and L are measured with the package seated in JEDEC seating plane gauge GS-3.
5. D, D1, and E1 dimensions do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.010 inch (0.25mm).
6. E and e_A are measured with the leads constrained to be perpendicular to datum -C-.
7. e_B and e_C are measured at the lead tips with the leads unconstrained. e_C must be zero or greater.
8. B1 maximum dimensions do not include dambar protrusions. Dambar protrusions shall not exceed 0.010 inch (0.25mm).
9. N is the maximum number of terminal positions.
10. Corner leads (1, N, N/2 and N/2 + 1) for E8.3, E16.3, E18.3, E28.3, E42.6 will have a B1 dimension of 0.030 - 0.045 inch (0.76 - 1.14mm).

E42.6

42 LEAD DUAL-IN-LINE PLASTIC PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.250	-	6.35	4
A1	0.015	-	0.39	-	4
A2	0.125	0.195	3.18	4.95	-
B	0.014	0.022	0.356	0.558	-
B1	0.030	0.070	0.77	1.77	8, 10
C	0.008	0.015	0.204	0.381	-
D	1.980	2.095	50.3	53.2	5
D1	0.005	-	0.13	-	5
E	0.600	0.625	15.24	15.87	6
E1	0.485	0.580	12.32	14.73	5
e	0.100 BSC		2.54 BSC		-
e_A	0.600 BSC		15.24 BSC		6
e_B	-	0.700	-	17.78	7
L	0.115	0.200	2.93	5.08	4
N	42		42		9

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Dual-In-Line Plastic Packages (PDIP)

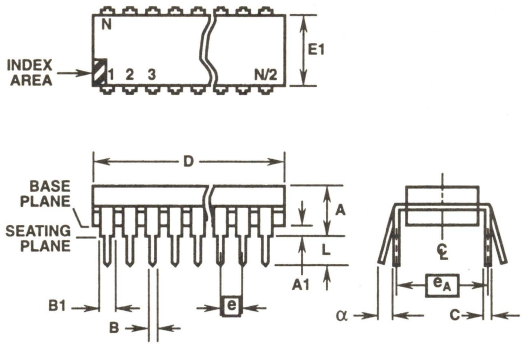

FIGURE 1

E42.6A-S

42 LEAD DUAL-IN-LINE PLASTIC PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.193	0.212	4.9	5.4	2
A1	0.040	-	1.0	-	2
B	0.018	0.025	0.45	0.65	-
B1	0.046	0.057	1.15	1.45	-
C	0.008	0.013	0.20	0.35	-
D	2.162	2.181	54.9	55.4	3
E1	0.516	0.531	13.1	13.50	3
e	0.100 BSC		2.54 BSC		-
e_A	0.600 BSC		15.24 BSC		4
L	0.119	-	3.0	-	2
N	42		42		5
α	0^o	15^o	0^o	15^o	-

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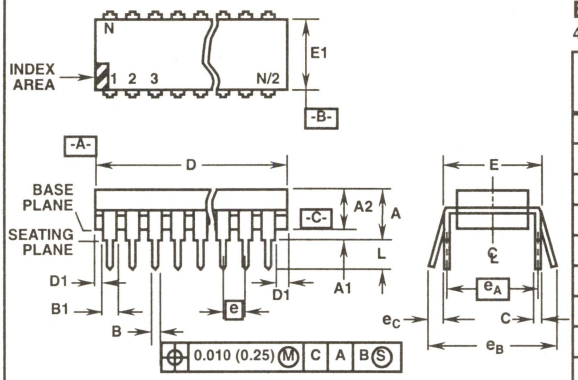
NOTES:

1. Controlling Dimensions: MILLIMETER. In case of conflict between English and Metric dimensions, the metric dimensions control.
2. Dimensions A, A1 and L are measured with the package seated in JEDEC seating plane gauge GS-3.
3. D and E1 dimensions do not include mold flash or protrusions.
4. e_A is measured with the leads constrained to be perpendicular to base plane.
5. N is the maximum number of terminal positions.

Dual-In-Line Plastic Packages (PDIP)



NOTES:

1. Controlling Dimensions: INCH. In case of conflict between English and Metric dimensions, the inch dimensions control.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication No. 95.
4. Dimensions A, A1 and L are measured with the package seated in JEDEC seating plane gauge GS-3.
5. D, D1, and E1 dimensions do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.010 inch (0.25mm).
6. E and e_A are measured with the leads constrained to be perpendicular to datum -C-.
7. e_B and e_C are measured at the lead tips with the leads unconstrained. e_C must be zero or greater.
8. B1 maximum dimensions do not include dambar protrusions. Dambar protrusions shall not exceed 0.010 inch (0.25mm).
9. N is the maximum number of terminal positions.
10. Corner leads (1, N, N/2 and N/2 + 1) for E8.3, E16.3, E18.3, E28.3, E42.6 will have a B1 dimension of 0.030 - 0.045 inch (0.76 - 1.14mm).

E48.6 (JEDEC MS-011-AD ISSUE B)
48 LEAD DUAL-IN-LINE PLASTIC PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.250	-	6.35	4
A1	0.015	-	0.39	-	4
A2	0.125	0.195	3.18	4.95	-
B	0.014	0.022	0.356	0.558	-
B1	0.030	0.070	0.77	1.77	8
C	0.008	0.015	0.204	0.381	-
D	2.385	2.480	60.70	63.1	5
D1	0.005	-	0.13	-	5
E	0.600	0.625	15.24	15.87	6
E1	0.485	0.580	12.32	14.73	5
e	0.100 BSC		2.54 BSC		-
e_A	0.600 BSC		15.24 BSC		6
e_B	-	0.700	-	17.78	7
L	0.115	0.200	2.93	5.08	4
N	48		48		9

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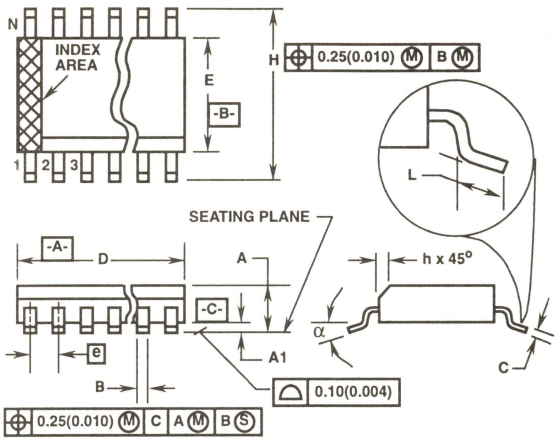
Small Outline Plastic Packages (SOIC)



M8.15 (JEDEC MS-012-AA ISSUE C)
8 LEAD NARROW BODY SMALL OUTLINE PLASTIC PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.0532	0.0688	1.35	1.75	-
A1	0.0040	0.0098	0.10	0.25	-
B	0.013	0.020	0.33	0.51	9
C	0.0075	0.0098	0.19	0.25	-
D	0.1890	0.1968	4.80	5.00	3
E	0.1497	0.1574	3.80	4.00	4
e	0.050 BSC		1.27 BSC		-
H	0.2284	0.2440	5.80	6.20	-
h	0.0099	0.0196	0.25	0.50	5
L	0.016	0.050	0.40	1.27	6
N	8		8		7
α	0^o	8^o	0^o	8^o	-

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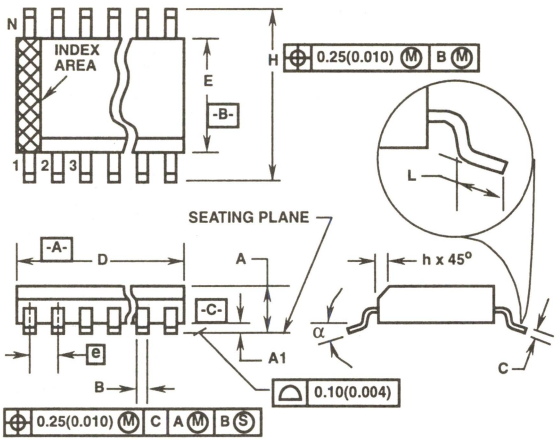
NOTES:

1. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication Number 95.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion and gate burrs shall not exceed 0.15mm (0.006 inch) per side.
4. Dimension "E" does not include interlead flash or protrusions. Interlead flash and protrusions shall not exceed 0.25mm (0.010 inch) per side.
5. The chamfer on the body is optional. If it is not present, a visual index feature must be located within the crosshatched area.
6. "L" is the length of terminal for soldering to a substrate.
7. "N" is the number of terminal positions.
8. Terminal numbers are shown for reference only.
9. The lead width "B", as measured 0.36mm (0.014 inch) or greater above the seating plane, shall not exceed a maximum value of 0.61mm (0.024 inch).
10. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.

Small Outline Plastic Packages (SOIC)



M14.15 (JEDEC MS-012-AB ISSUE C)
14 LEAD NARROW BODY SMALL OUTLINE PLASTIC PACKAGE

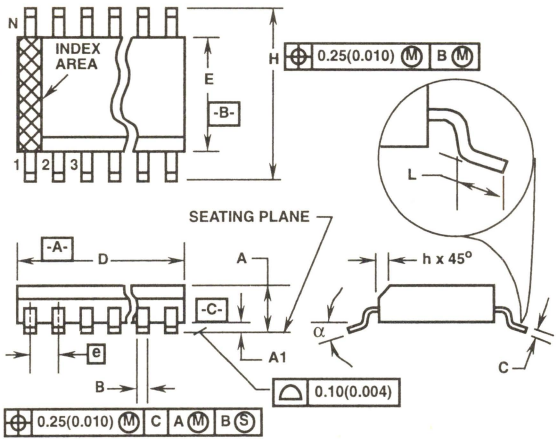
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.0532	0.0688	1.35	1.75	-
A1	0.0040	0.0098	0.10	0.25	-
B	0.013	0.020	0.33	0.51	9
C	0.0075	0.0098	0.19	0.25	-
D	0.3367	0.3444	8.55	8.75	3
E	0.1497	0.1574	3.80	4.00	4
e	0.050 BSC		1.27 BSC		-
H	0.2284	0.2440	5.80	6.20	-
h	0.0099	0.0196	0.25	0.50	5
L	0.016	0.050	0.40	1.27	6
N	14		14		7
α	0°	8°	0°	8°	-

Rev. 0 12/93

NOTES:

1. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication Number 95.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion and gate burrs shall not exceed 0.15mm (0.006 inch) per side.
4. Dimension "E" does not include interlead flash or protrusions. Interlead flash and protrusions shall not exceed 0.25mm (0.010 inch) per side.
5. The chamfer on the body is optional. If it is not present, a visual index feature must be located within the crosshatched area.
6. "L" is the length of terminal for soldering to a substrate.
7. "N" is the number of terminal positions.
8. Terminal numbers are shown for reference only.
9. The lead width "B", as measured 0.36mm (0.014 inch) or greater above the seating plane, shall not exceed a maximum value of 0.61mm (0.024 inch).
10. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.

Small Outline Plastic Packages (SOIC)



M16.15 (JEDEC MS-012-AC ISSUE C)
16 LEAD NARROW BODY SMALL OUTLINE PLASTIC PACKAGE

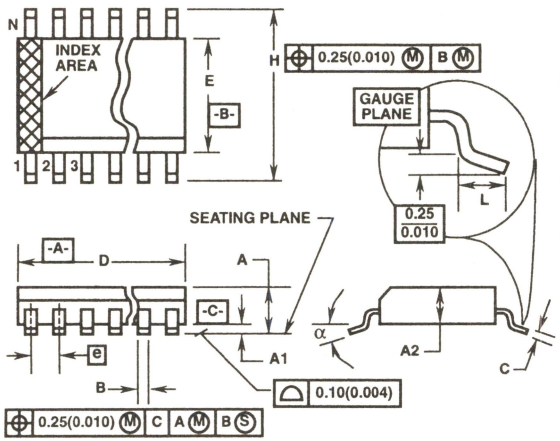
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.0532	0.0688	1.35	1.75	-
A1	0.0040	0.0098	0.10	0.25	-
B	0.013	0.020	0.33	0.51	9
C	0.0075	0.0098	0.19	0.25	-
D	0.3859	0.3937	9.80	10.00	3
E	0.1497	0.1574	3.80	4.00	4
e	0.050 BSC		1.27 BSC		-
H	0.2284	0.2440	5.80	6.20	-
h	0.0099	0.0196	0.25	0.50	5
L	0.016	0.050	0.40	1.27	6
N	16		16		7
α	0^o	8^o	0^o	8^o	-

Rev. 0 12/93

NOTES:

1. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication Number 95.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion and gate burrs shall not exceed 0.15mm (0.006 inch) per side.
4. Dimension "E" does not include interlead flash or protrusions. Interlead flash and protrusions shall not exceed 0.25mm (0.010 inch) per side.
5. The chamfer on the body is optional. If it is not present, a visual index feature must be located within the crosshatched area.
6. "L" is the length of terminal for soldering to a substrate.
7. "N" is the number of terminal positions.
8. Terminal numbers are shown for reference only.
9. The lead width "B", as measured 0.36mm (0.014 inch) or greater above the seating plane, shall not exceed a maximum value of 0.61mm (0.024 inch)
10. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.

Shrink Small Outline Plastic Packages (SSOP)



M16.209 (JEDEC MO-150-AC ISSUE B)
16 LEAD SHRINK SMALL OUTLINE PLASTIC PACKAGE

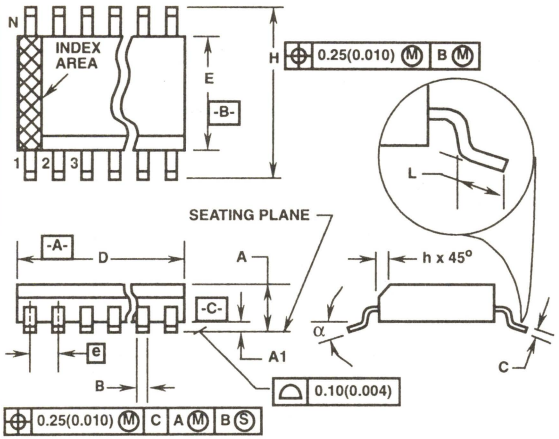
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.078	-	2.00	-
A1	0.002	-	0.05	-	-
A2	0.065	0.072	1.65	1.85	-
B	0.009	0.014	0.22	0.38	9
C	0.004	0.009	0.09	0.25	-
D	0.233	0.255	5.90	6.50	3
E	0.197	0.220	5.00	5.60	4
e	0.026 BSC		0.65 BSC		-
H	0.292	0.322	7.40	8.20	-
L	0.022	0.037	0.55	0.95	6
N	16		16		7
α	0^o	8^o	0^o	8^o	-

Rev. 2 3/95

NOTES:

1. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication Number 95.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion and gate burrs shall not exceed 0.20mm (0.0078 inch) per side.
4. Dimension "E" does not include interlead flash or protrusions. Interlead flash and protrusions shall not exceed 0.20mm (0.0078 inch) per side.
5. The chamfer on the body is optional. If it is not present, a visual index feature must be located within the crosshatched area.
6. "L" is the length of terminal for soldering to a substrate.
7. "N" is the number of terminal positions.
8. Terminal numbers are shown for reference only.
9. Dimension "B" does not include dambar protrusion. Allowable dambar protrusion shall be 0.13mm (0.005 inch) total in excess of "B" dimension at maximum material condition.
10. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.

Small Outline Plastic Packages (SOIC)



M16.3 (JEDEC MS-013-AA ISSUE C)
16 LEAD WIDE BODY SMALL OUTLINE PLASTIC PACKAGE

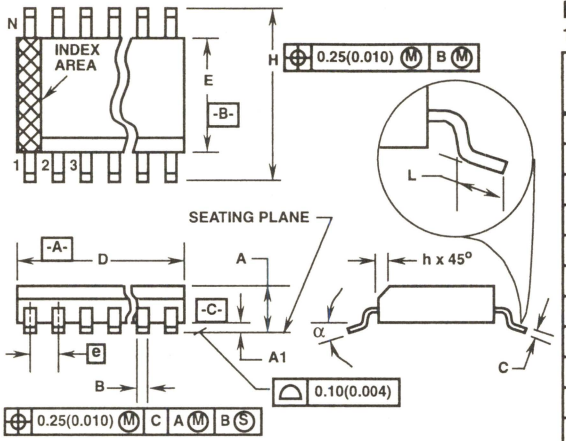
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.0926	0.1043	2.35	2.65	-
A1	0.0040	0.0118	0.10	0.30	-
B	0.013	0.0200	0.33	0.51	9
C	0.0091	0.0125	0.23	0.32	-
D	0.3977	0.4133	10.10	10.50	3
E	0.2914	0.2992	7.40	7.60	4
e	0.050 BSC		1.27 BSC		-
H	0.394	0.419	10.00	10.65	-
h	0.010	0.029	0.25	0.75	5
L	0.016	0.050	0.40	1.27	6
N	16		16		7
α	0^o	8^o	0^o	8^o	-

Rev. 0 12/93

NOTES:

1. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication Number 95.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion and gate burrs shall not exceed 0.15mm (0.006 inch) per side.
4. Dimension "E" does not include interlead flash or protrusions. Interlead flash and protrusions shall not exceed 0.25mm (0.010 inch) per side.
5. The chamfer on the body is optional. If it is not present, a visual index feature must be located within the crosshatched area.
6. "L" is the length of terminal for soldering to a substrate.
7. "N" is the number of terminal positions.
8. Terminal numbers are shown for reference only.
9. The lead width "B", as measured 0.36mm (0.014 inch) or greater above the seating plane, shall not exceed a maximum value of 0.61mm (0.024 inch)
10. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.

Small Outline Plastic Packages (SOIC)



M18.3 (JEDEC MS-013-AB ISSUE C)
18 LEAD WIDE BODY SMALL OUTLINE PLASTIC PACKAGE

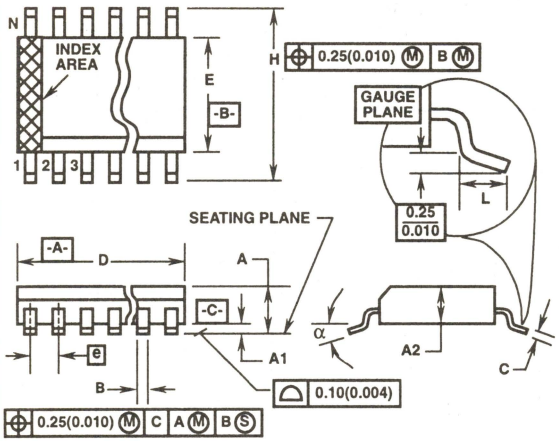
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.0926	0.1043	2.35	2.65	-
A1	0.0040	0.0118	0.10	0.30	-
B	0.013	0.0200	0.33	0.51	9
C	0.0091	0.0125	0.23	0.32	-
D	0.4469	0.4625	11.35	11.75	3
E	0.2914	0.2992	7.40	7.60	4
e	0.050 BSC		1.27 BSC		-
H	0.394	0.419	10.00	10.65	-
h	0.010	0.029	0.25	0.75	5
L	0.016	0.050	0.40	1.27	6
N	18		18		7
α	0°	8°	0°	8°	-

Rev. 0 12/93

NOTES:

1. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication Number 95.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion and gate burrs shall not exceed 0.15mm (0.006 inch) per side.
4. Dimension "E" does not include interlead flash or protrusions. Interlead flash and protrusions shall not exceed 0.25mm (0.010 inch) per side.
5. The chamfer on the body is optional. If it is not present, a visual index feature must be located within the crosshatched area.
6. "L" is the length of terminal for soldering to a substrate.
7. "N" is the number of terminal positions.
8. Terminal numbers are shown for reference only.
9. The lead width "B", as measured 0.36mm (0.014 inch) or greater above the seating plane, shall not exceed a maximum value of 0.61mm (0.024 inch)
10. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.

Shrink Small Outline Plastic Packages (SSOP)



M20.209 (JEDEC MO-150-AE ISSUE B)
20 LEAD SHRINK SMALL OUTLINE PLASTIC PACKAGE

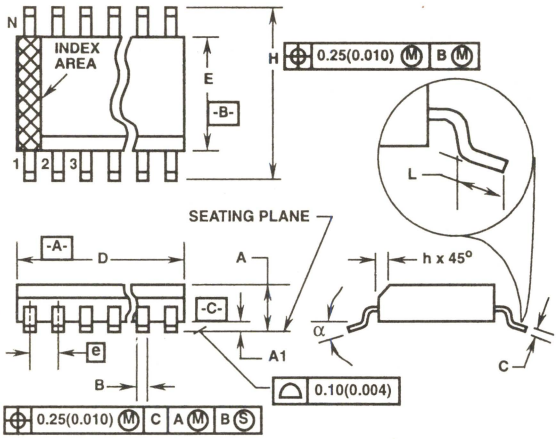
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.078	-	2.00	-
A1	0.002	-	0.05	-	-
A2	0.065	0.072	1.65	1.85	-
B	0.009	0.014	0.22	0.38	9
C	0.004	0.009	0.09	0.25	-
D	0.272	0.295	6.90	7.50	3
E	0.197	0.220	5.00	5.60	4
e	0.026 BSC		0.65 BSC		-
H	0.292	0.322	7.40	8.20	-
L	0.022	0.037	0.55	0.95	6
N	20		20		7
α	0°	8°	0°	8°	-

Rev. 2 4/95

NOTES:

1. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication Number 95.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion and gate burrs shall not exceed 0.20mm (0.0078 inch) per side.
4. Dimension "E" does not include interlead flash or protrusions. Interlead flash and protrusions shall not exceed 0.20mm (0.0078 inch) per side.
5. The chamfer on the body is optional. If it is not present, a visual index feature must be located within the crosshatched area.
6. "L" is the length of terminal for soldering to a substrate.
7. "N" is the number of terminal positions.
8. Terminal numbers are shown for reference only.
9. Dimension "B" does not include dambar protrusion. Allowable dambar protrusion shall be 0.13mm (0.005 inch) total in excess of "B" dimension at maximum material condition.
10. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.

Small Outline Plastic Packages (SOIC)



M20.3 (JEDEC MS-013-AC ISSUE C)
20 LEAD WIDE BODY SMALL OUTLINE PLASTIC PACKAGE

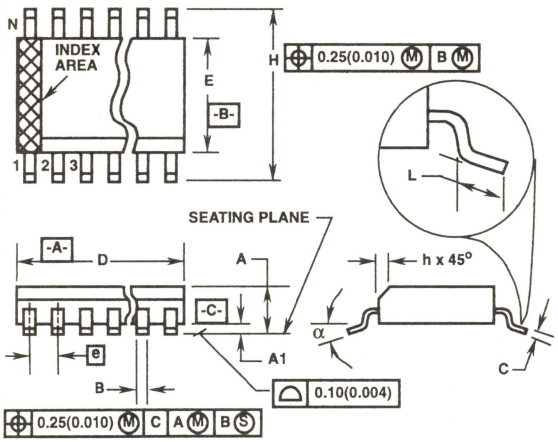
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.0926	0.1043	2.35	2.65	-
A1	0.0040	0.0118	0.10	0.30	-
B	0.013	0.0200	0.33	0.51	9
C	0.0091	0.0125	0.23	0.32	-
D	0.4961	0.5118	12.60	13.00	3
E	0.2914	0.2992	7.40	7.60	4
e	0.050 BSC		1.27 BSC		-
H	0.394	0.419	10.00	10.65	-
h	0.010	0.029	0.25	0.75	5
L	0.016	0.050	0.40	1.27	6
N	20		20		7
α	0°	8°	0°	8°	-

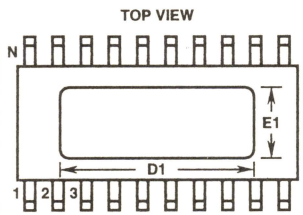
Rev. 0 12/93

NOTES:

1. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication Number 95.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion and gate burrs shall not exceed 0.15mm (0.006 inch) per side.
4. Dimension "E" does not include interlead flash or protrusions. Interlead flash and protrusions shall not exceed 0.25mm (0.010 inch) per side.
5. The chamfer on the body is optional. If it is not present, a visual index feature must be located within the crosshatched area.
6. "L" is the length of terminal for soldering to a substrate.
7. "N" is the number of terminal positions.
8. Terminal numbers are shown for reference only.
9. The lead width "B", as measured 0.36mm (0.014 inch) or greater above the seating plane, shall not exceed a maximum value of 0.61mm (0.024 inch)
10. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.

Power Small Outline Plastic Packages (PSOP)





POWER SOP PACKAGE
(HEAT SLUG SURFACE IS ELECTRICALLY FLOATING)

M20.3A

20 LEAD POWER SMALL OUTLINE PLASTIC PACKAGE

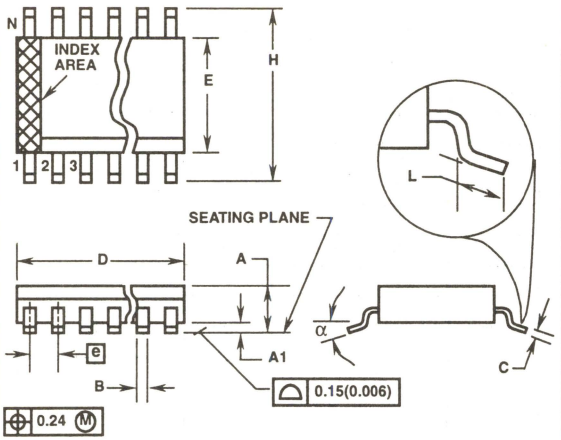
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.0926	0.1043	2.35	2.65	-
A1	0.0040	0.0118	0.10	0.30	-
B	0.013	0.0200	0.33	0.51	9
C	0.0091	0.0125	0.23	0.32	-
D	0.4961	0.5118	12.60	13.00	3
D1	0.325	0.340	8.25	8.63	10
E	0.2914	0.2992	7.40	7.60	4
E1	0.175	0.190	4.44	4.82	10
e	0.050 BSC		1.27 BSC		-
H	0.394	0.419	10.00	10.65	-
h	0.010	0.029	0.25	0.75	5
L	0.016	0.050	0.40	1.27	6
N	20		20		7
α	0^o	8^o	0^o	8^o	-

Rev. 0 6/95

NOTES:

1. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication Number 95.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion and gate burrs shall not exceed 0.15mm (0.006 inch) per side.
4. Dimension "E" does not include interlead flash or protrusions. Interlead flash and protrusions shall not exceed 0.25mm (0.010 inch) per side.
5. The chamfer on the body is optional. If it is not present, a visual index feature must be located within the crosshatched area.
6. "L" is the length of terminal for soldering to a substrate.
7. "N" is the number of terminal positions.
8. Terminal numbers are shown for reference only.
9. The lead width "B", as measured 0.36mm (0.014 inch) or greater above the seating plane, shall not exceed a maximum value of 0.61mm (0.024 inch)
10. Exposed copper heat slug flush with top surface of package. All other dimensions conform to JEDEC MS-013AC Issue C.
11. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.

Small Outline Plastic Packages (SOIC)



M24.2-S

24 LEAD SMALL OUTLINE PLASTIC PACKAGE (200 MIL)

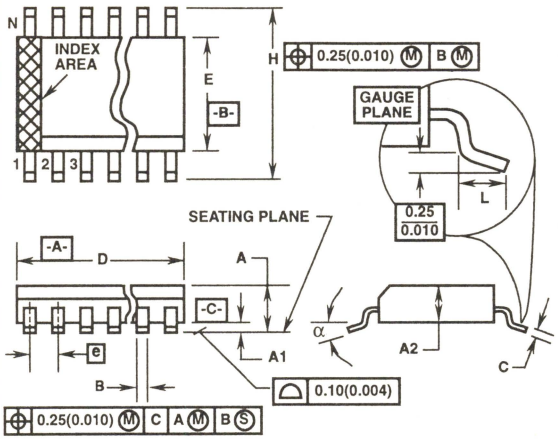
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.067	0.088	1.70	2.25	-
A1	0.002	0.011	0.05	0.30	-
B	0.014	0.021	0.35	0.55	-
C	0.006	0.011	0.15	0.30	-
D	0.587	0.606	14.9	15.4	1
E	0.205	0.220	5.2	5.6	2
e	0.050 BSC		1.27 BSC		-
H	0.296	0.326	7.5	8.3	-
L	0.012	0.027	0.30	0.70	3
N	24		24		4
α	0^o	10^o	0^o	10^o	-

Rev. 1 4/95

NOTES:

1. Dimension "D" does not include mold flash, protrusions or gate burrs.
2. Dimension "E" does not include interlead flash or protrusions.
3. "L" is the length of terminal for soldering to a substrate.
4. "N" is the number of terminal positions.
5. Terminal numbers are shown for reference only.
6. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.

Shrink Small Outline Plastic Packages (SSOP)



M24.209 (JEDEC MO-150-AG ISSUE B)

24 LEAD SHRINK SMALL OUTLINE PLASTIC PACKAGE

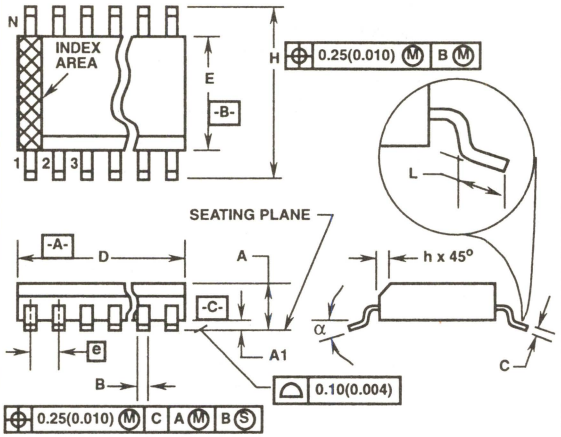
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.078	-	2.00	-
A1	0.002	-	0.05	-	-
A2	0.065	0.072	1.65	1.85	-
B	0.009	0.014	0.22	0.38	9
C	0.004	0.009	0.09	0.25	-
D	0.312	0.334	7.90	8.50	3
E	0.197	0.220	5.00	5.60	4
e	0.026 BSC		0.65 BSC		-
H	0.292	0.322	7.40	8.20	-
L	0.022	0.037	0.55	0.95	6
N	24		24		7
α	0^o	8^o	0^o	8^o	-

Rev. 1 3/95

NOTES:

1. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication Number 95.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion and gate burrs shall not exceed 0.20mm (0.0078 inch) per side.
4. Dimension "E" does not include interlead flash or protrusions. Interlead flash and protrusions shall not exceed 0.20mm (0.0078 inch) per side.
5. The chamfer on the body is optional. If it is not present, a visual index feature must be located within the crosshatched area.
6. "L" is the length of terminal for soldering to a substrate.
7. "N" is the number of terminal positions.
8. Terminal numbers are shown for reference only.
9. Dimension "B" does not include dambar protrusion. Allowable dambar protrusion shall be 0.13mm (0.005 inch) total in excess of "B" dimension at maximum material condition.
10. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.

Small Outline Plastic Packages (SOIC)



M24.3 (JEDEC MS-013-AD ISSUE C)
24 LEAD WIDE BODY SMALL OUTLINE PLASTIC PACKAGE

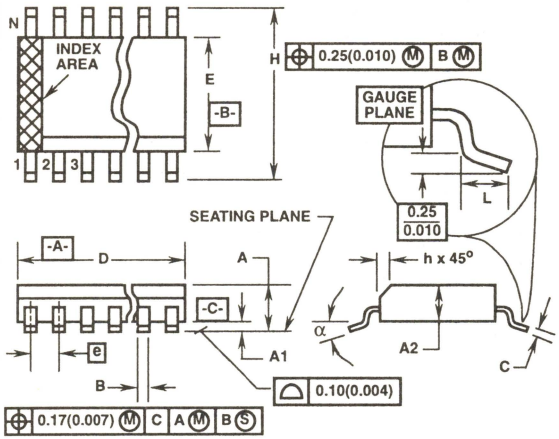
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.0926	0.1043	2.35	2.65	-
A1	0.0040	0.0118	0.10	0.30	-
B	0.013	0.020	0.33	0.51	9
C	0.0091	0.0125	0.23	0.32	-
D	0.5985	0.6141	15.20	15.60	3
E	0.2914	0.2992	7.40	7.60	4
e	0.05 BSC		1.27 BSC		-
H	0.394	0.419	10.00	10.65	-
h	0.010	0.029	0.25	0.75	5
L	0.016	0.050	0.40	1.27	6
N	24		24		7
α	0^o	8^o	0^o	8^o	-

Rev. 0 12/93

NOTES:

1. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication Number 95.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion and gate burrs shall not exceed 0.15mm (0.006 inch) per side.
4. Dimension "E" does not include interlead flash or protrusions. Interlead flash and protrusions shall not exceed 0.25mm (0.010 inch) per side.
5. The chamfer on the body is optional. If it is not present, a visual index feature must be located within the crosshatched area.
6. "L" is the length of terminal for soldering to a substrate.
7. "N" is the number of terminal positions.
8. Terminal numbers are shown for reference only.
9. The lead width "B", as measured 0.36mm (0.014 inch) or greater above the seating plane, shall not exceed a maximum value of 0.61mm (0.024 inch)
10. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.

Shrink Small Outline Plastic Packages (SSOP)



M28.15

28 LEAD SHRINK NARROW BODY SMALL OUTLINE PLASTIC PACKAGE

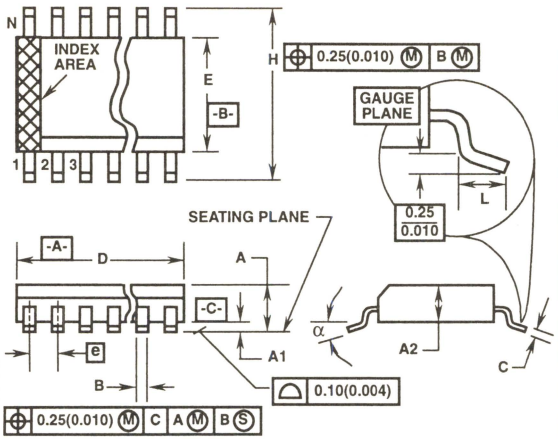
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.053	0.069	1.35	1.75	-
A1	0.004	0.010	0.10	0.25	-
A2	-	0.061	-	1.54	-
B	0.008	0.012	0.20	0.30	9
C	0.007	0.010	0.18	0.25	-
D	0.386	0.394	9.81	10.00	3
E	0.150	0.157	3.81	3.98	4
e	0.025 BSC		0.635 BSC		-
H	0.228	0.244	5.80	6.19	-
h	0.0099	0.0196	0.26	0.49	5
L	0.016	0.050	0.41	1.27	6
N	28		28		7
α	0°	8°	0°	8°	-

Rev. 0 2/95

NOTES:

1. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication Number 95.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion and gate burrs shall not exceed 0.15mm (0.006 inch) per side.
4. Dimension "E" does not include interlead flash or protrusions. Interlead flash and protrusions shall not exceed 0.25mm (0.010 inch) per side.
5. The chamfer on the body is optional. If it is not present, a visual index feature must be located within the crosshatched area.
6. "L" is the length of terminal for soldering to a substrate.
7. "N" is the number of terminal positions.
8. Terminal numbers are shown for reference only.
9. Dimension "B" does not include dambar protrusion. Allowable dambar protrusion shall be 0.10mm (0.004 inch) total in excess of "B" dimension at maximum material condition.
10. Controlling dimension: INCHES. Converted millimeter dimensions are not necessarily exact.

Shrink Small Outline Plastic Packages (SSOP)



M28.209 (JEDEC MO-150-AH ISSUE B)
28 LEAD SHRINK SMALL OUTLINE PLASTIC PACKAGE

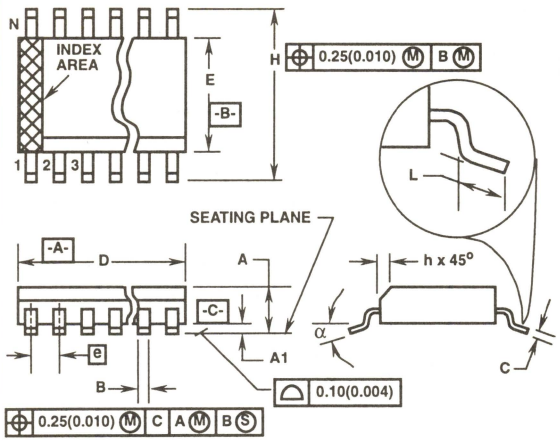
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.078	-	2.00	-
A1	0.002	-	0.05	-	-
A2	0.065	0.072	1.65	1.85	-
B	0.009	0.014	0.22	0.38	9
C	0.004	0.009	0.09	0.25	-
D	0.390	0.413	9.90	10.50	3
E	0.197	0.220	5.00	5.60	4
e	0.026 BSC		0.65 BSC		-
H	0.292	0.322	7.40	8.20	-
L	0.022	0.037	0.55	0.95	6
N	28		28		7
α	0^o	8^o	0^o	8^o	-

Rev. 1 3/95

NOTES:

1. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication Number 95.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion and gate burrs shall not exceed 0.20mm (0.0078 inch) per side.
4. Dimension "E" does not include interlead flash or protrusions. Interlead flash and protrusions shall not exceed 0.20mm (0.0078 inch) per side.
5. The chamfer on the body is optional. If it is not present, a visual index feature must be located within the crosshatched area.
6. "L" is the length of terminal for soldering to a substrate.
7. "N" is the number of terminal positions.
8. Terminal numbers are shown for reference only.
9. Dimension "B" does not include dambar protrusion. Allowable dambar protrusion shall be 0.13mm (0.005 inch) total in excess of "B" dimension at maximum material condition.
10. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.

Small Outline Plastic Packages (SOIC)



M28.3 (JEDEC MS-013-AE ISSUE C)
28 LEAD WIDE BODY SMALL OUTLINE PLASTIC PACKAGE

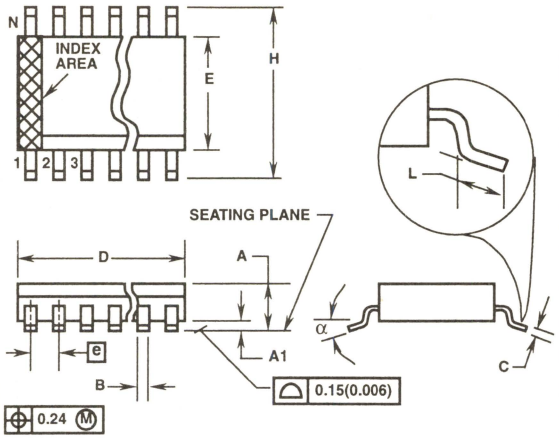
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.0926	0.1043	2.35	2.65	-
A1	0.0040	0.0118	0.10	0.30	-
B	0.013	0.0200	0.33	0.51	9
C	0.0091	0.0125	0.23	0.32	-
D	0.6969	0.7125	17.70	18.10	3
E	0.2914	0.2992	7.40	7.60	4
e	0.05 BSC		1.27 BSC		-
H	0.394	0.419	10.00	10.65	-
h	0.01	0.029	0.25	0.75	5
L	0.016	0.050	0.40	1.27	6
N	28		28		7
α	0°	8°	0°	8°	-

Rev. 0 12/93

NOTES:

1. Symbols are defined in the "MO Series Symbol List" in Section 2.2 of Publication Number 95.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion and gate burrs shall not exceed 0.15mm (0.006 inch) per side.
4. Dimension "E" does not include interlead flash or protrusions. Interlead flash and protrusions shall not exceed 0.25mm (0.010 inch) per side.
5. The chamfer on the body is optional. If it is not present, a visual index feature must be located within the crosshatched area.
6. "L" is the length of terminal for soldering to a substrate.
7. "N" is the number of terminal positions.
8. Terminal numbers are shown for reference only.
9. The lead width "B", as measured 0.36mm (0.014 inch) or greater above the seating plane, shall not exceed a maximum value of 0.61mm (0.024 inch)
10. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.

Small Outline Plastic Packages (SOIC)



M28.3A-S

28 LEAD SMALL OUTLINE PLASTIC PACKAGE (300 MIL)

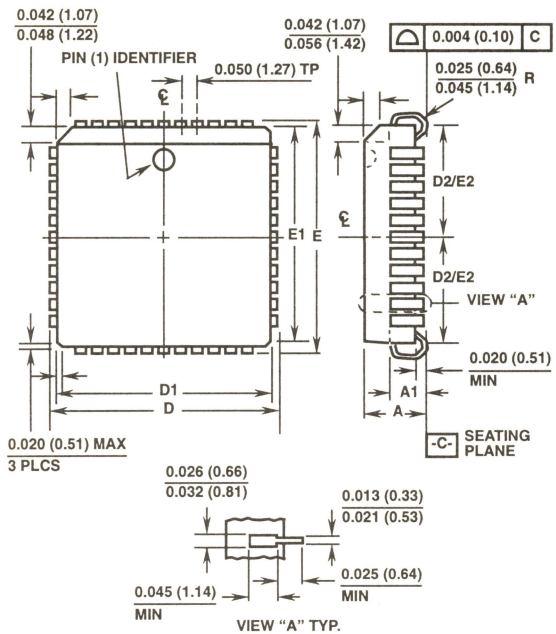
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.085	0.106	2.15	2.7	-
A1	0.002	0.011	0.05	0.30	-
B	0.014	0.021	0.35	0.55	-
C	0.004	0.009	0.10	0.25	-
D	0.737	0.755	18.7	19.2	1
E	0.296	0.311	7.50	7.90	2
e	0.05 BSC		1.27 BSC		-
H	0.390	0.421	9.90	10.70	-
L	0.012	0.027	0.30	0.70	3
N	28		28		4
α	0^o	10^o	0^o	10^o	-

Rev. 1 4/95

NOTES:

1. Dimension "D" does not include mold flash, protrusions or gate burrs.
2. Dimension "E" does not include interlead flash or protrusions.
3. "L" is the length of terminal for soldering to a substrate.
4. "N" is the number of terminal positions.
5. Terminal numbers are shown for reference only.
6. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.

Plastic Leaded Chip Carrier Packages (PLCC)



N20.35 (JEDEC MS-018AA ISSUE A)
20 LEAD PLASTIC LEADED CHIP CARRIER PACKAGE

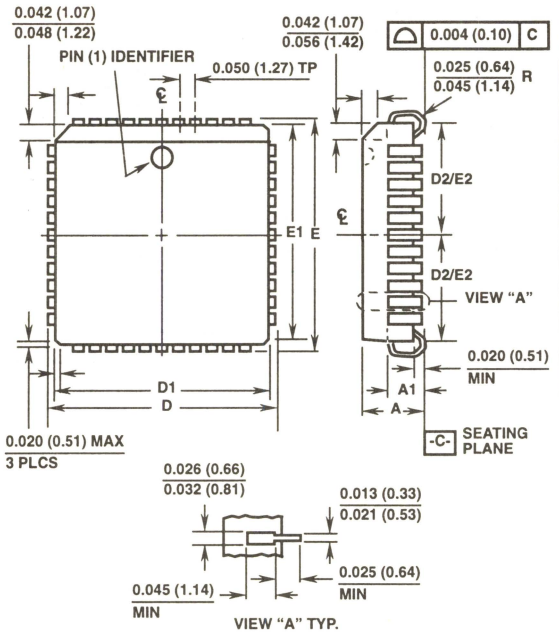
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.165	0.180	4.20	4.57	-
A1	0.090	0.120	2.29	3.04	-
D	0.385	0.395	9.78	10.03	-
D1	0.350	0.356	8.89	9.04	3
D2	0.141	0.169	3.59	4.29	4, 5
E	0.385	0.395	9.78	10.03	-
E1	0.350	0.356	8.89	9.04	3
E2	0.141	0.169	3.59	4.29	4, 5
N	20		20		6

Rev. 1 3/95

NOTES:

1. Controlling dimension: INCH. Converted millimeter dimensions are not necessarily exact.
2. Dimensions and tolerancing per ANSI Y14.5M-1982.
3. Dimensions D1 and E1 do not include mold protrusions. Allowable mold protrusion is 0.010 inch (0.25mm) per side.
4. To be measured at seating plane -C- contact point.
5. Centerline to be determined where center leads exit plastic body.
6. "N" is the number of terminal positions.

Plastic Leaded Chip Carrier Packages (PLCC)



N28.45 (JEDEC MS-018AB ISSUE A)
28 LEAD PLASTIC LEADED CHIP CARRIER PACKAGE

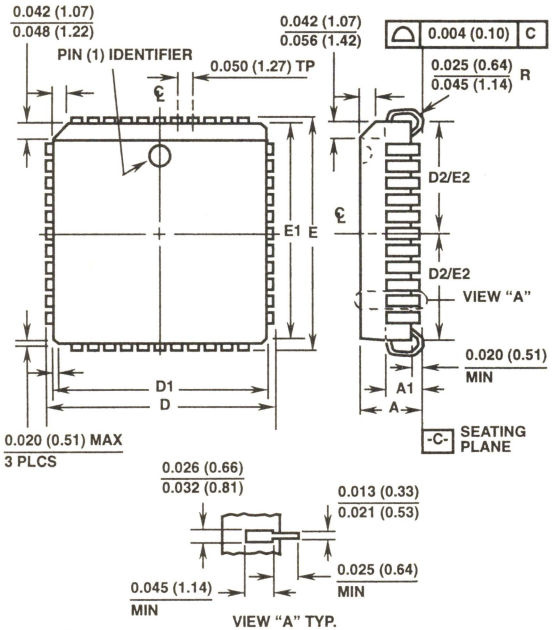
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.165	0.180	4.20	4.57	-
A1	0.090	0.120	2.29	3.04	-
D	0.485	0.495	12.32	12.57	-
D1	0.450	0.456	11.43	11.58	3
D2	0.191	0.219	4.86	5.56	4, 5
E	0.485	0.495	12.32	12.57	-
E1	0.450	0.456	11.43	11.58	3
E2	0.191	0.219	4.86	5.56	4, 5
N	28		28		6

Rev. 1 3/95

NOTES:

1. Controlling dimension: INCH. Converted millimeter dimensions are not necessarily exact.
2. Dimensions and tolerancing per ANSI Y14.5M-1982.
3. Dimensions D1 and E1 do not include mold protrusions. Allowable mold protrusion is 0.010 inch (0.25mm) per side.
4. To be measured at seating plane -C- contact point.
5. Centerline to be determined where center leads exit plastic body.
6. "N" is the number of terminal positions.

Plastic Leaded Chip Carrier Packages (PLCC)



N44.65 (JEDEC MS-018AC ISSUE A)
44 LEAD PLASTIC LEADED CHIP CARRIER PACKAGE

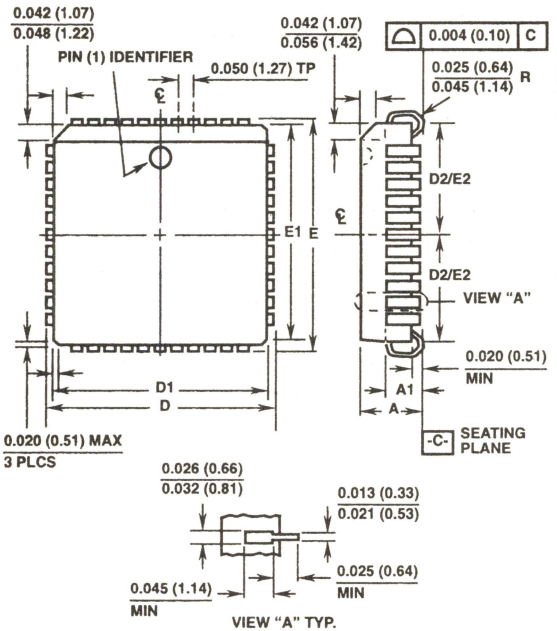
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.165	0.180	4.20	4.57	-
A1	0.090	0.120	2.29	3.04	-
D	0.685	0.695	17.40	17.65	-
D1	0.650	0.656	16.51	16.66	3
D2	0.291	0.319	7.40	8.10	4, 5
E	0.685	0.695	17.40	17.65	-
E1	0.650	0.656	16.51	16.66	3
E2	0.291	0.319	7.40	8.10	4, 5
N	44		44		6

Rev. 1 3/95

NOTES:

1. Controlling dimension: INCH. Converted millimeter dimensions are not necessarily exact.
2. Dimensions and tolerancing per ANSI Y14.5M-1982.
3. Dimensions D1 and E1 do not include mold protrusions. Allowable mold protrusion is 0.010 inch (0.25mm) per side.
4. To be measured at seating plane -C- contact point.
5. Centerline to be determined where center leads exit plastic body.
6. "N" is the number of terminal positions.

Plastic Leaded Chip Carrier Packages (PLCC)



N68.95 (JEDEC MS-018AE ISSUE A)
68 LEAD PLASTIC LEADED CHIP CARRIER PACKAGE

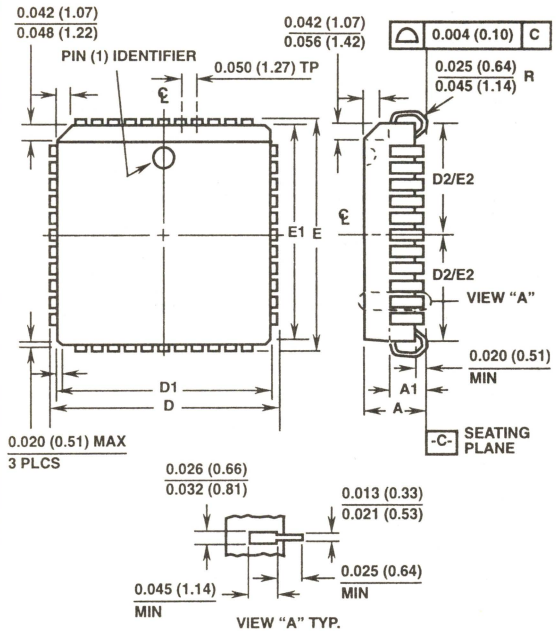
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.165	0.180	4.20	4.57	-
A1	0.090	0.120	2.29	3.04	-
D	0.985	0.995	25.02	25.27	-
D1	0.950	0.958	24.13	24.33	3
D2	0.441	0.469	11.21	11.91	4, 5
E	0.985	0.995	25.02	25.27	-
E1	0.950	0.958	24.13	24.33	3
E2	0.441	0.469	11.21	11.91	4, 5
N	68		68		6

Rev. 1 3/95

NOTES:

1. Controlling dimension: INCH. Converted millimeter dimensions are not necessarily exact.
2. Dimensions and tolerancing per ANSI Y14.5M-1982.
3. Dimensions D1 and E1 do not include mold protrusions. Allowable mold protrusion is 0.010 inch (0.25mm) per side.
4. To be measured at seating plane -C- contact point.
5. Centerline to be determined where center leads exit plastic body.
6. "N" is the number of terminal positions.

Plastic Leaded Chip Carrier Packages (PLCC)



N84.1.15 (JEDEC MS-018AF ISSUE A)
84 LEAD PLASTIC LEADED CHIP CARRIER PACKAGE

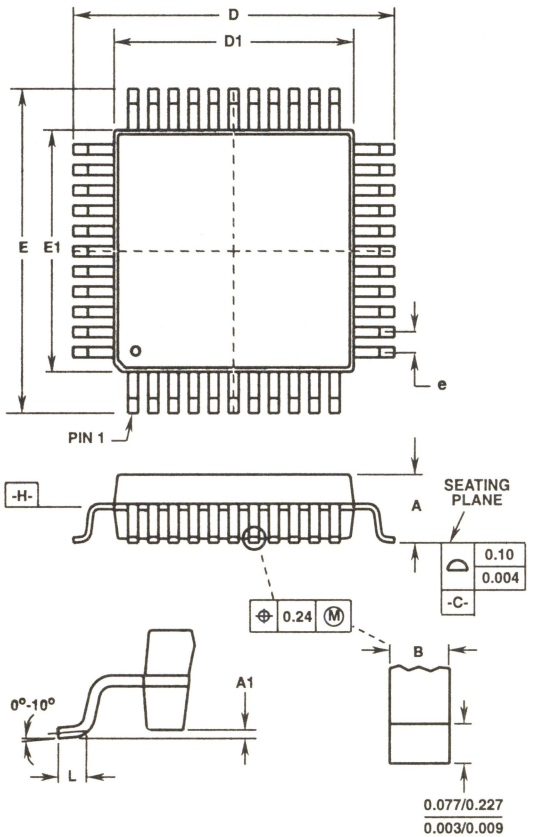
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.165	0.180	4.20	4.57	-
A1	0.090	0.120	2.29	3.04	-
D	1.185	1.195	30.10	30.35	-
D1	1.150	1.158	29.21	29.41	3
D2	0.541	0.569	13.75	14.45	4, 5
E	1.185	1.195	30.10	30.35	-
E1	1.150	1.158	29.21	29.41	3
E2	0.541	0.569	13.75	14.45	4, 5
N	84		84		6

Rev. 1 3/95

NOTES:

1. Controlling dimension: INCH. Converted millimeter dimensions are not necessarily exact.
2. Dimensions and tolerancing per ANSI Y14.5M-1982.
3. Dimensions D1 and E1 do not include mold protrusions. Allowable mold protrusion is 0.010 inch (0.25mm) per side.
4. To be measured at seating plane -C- contact point.
5. Centerline to be determined where center leads exit plastic body.
6. "N" is the number of terminal positions.

Metric Plastic Quad Flatpack Packages (MQFP)



Q32.7x7-S

32 LEAD METRIC PLASTIC QUAD FLATPACK PACKAGE

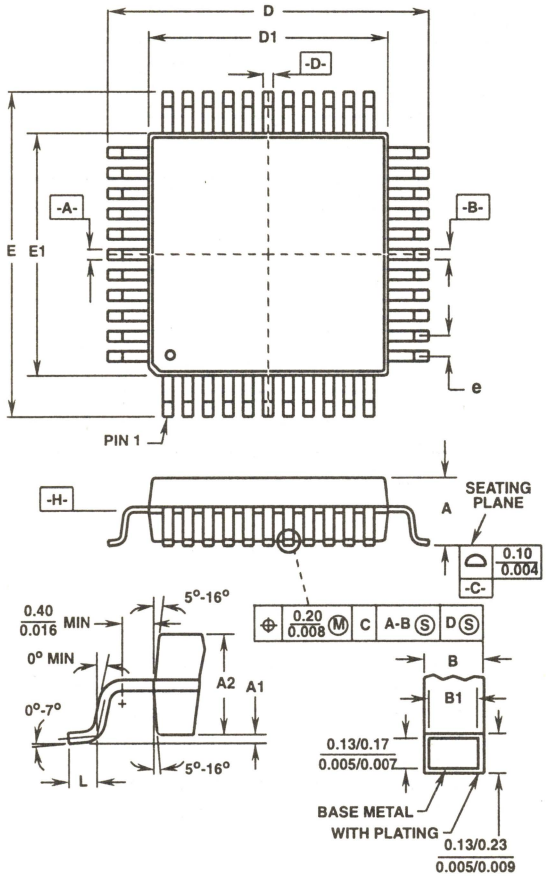
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.054	0.072	1.35	1.85	-
A1	0.000	0.011	0.00	0.30	-
B	0.008	0.017	0.20	0.45	5
D	0.347	0.362	8.80	9.20	2
D1	0.272	0.287	6.90	7.30	3, 4
E	0.347	0.362	8.80	9.20	2
E1	0.272	0.287	6.90	7.30	3, 4
L	0.012	0.027	0.30	0.70	-
N	32		32		6
e	0.032 BSC		0.80 BSC		-

Rev. 2 4/95

NOTES:

1. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.
2. Dimensions D and E to be determined at seating plane -C-.
3. Dimensions D1 and E1 to be determined at datum plane -H-.
4. Dimensions D1 and E1 do not include mold protrusion.
5. Dimension B does not include dambar protrusion.
6. "N" is the number of terminal positions.

Metric Plastic Quad Flatpack Packages (MQFP)



Q44.10x10 (JEDEC MO-108AA-2 ISSUE A)
44 LEAD METRIC PLASTIC QUAD FLATPACK PACKAGE

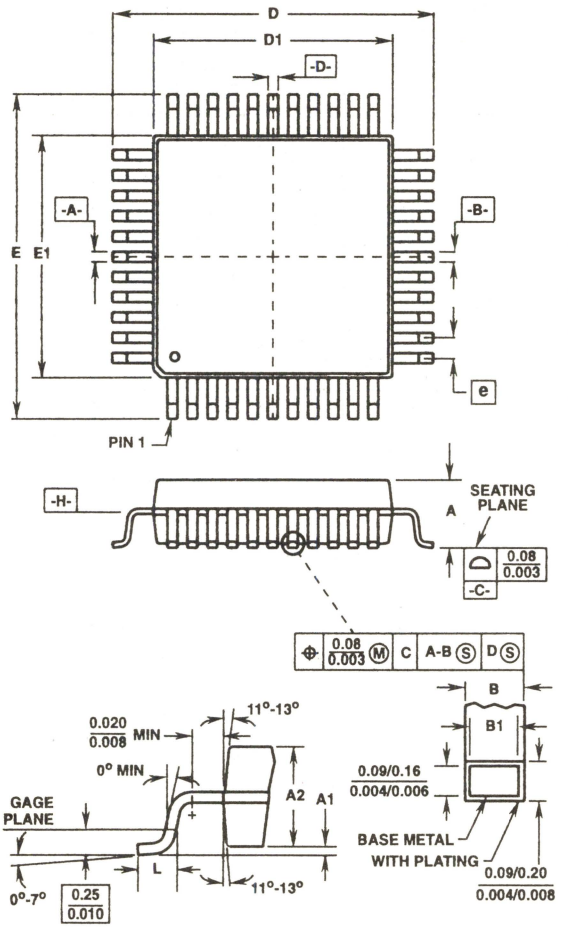
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.093	-	2.35	-
A1	0.004	0.010	0.10	0.25	-
A2	0.077	0.083	1.95	2.10	-
B	0.012	0.018	0.30	0.45	6
B1	0.012	0.016	0.30	0.40	-
D	0.510	0.530	12.95	13.45	3
D1	0.390	0.398	9.90	10.10	4, 5
E	0.510	0.530	12.95	13.45	3
E1	0.390	0.398	9.90	10.10	4, 5
L	0.026	0.037	0.65	0.95	-
N	44		44		7
e	0.032 BSC		0.80 BSC		-

Rev. 1 1/94

NOTES:

1. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.
2. All dimensions and tolerances per ANSI Y14.5M-1982.
3. Dimensions D and E to be determined at seating plane -C-.
4. Dimensions D1 and E1 to be determined at datum plane -H-.
5. Dimensions D1 and E1 do not include mold protrusion. Allowable protrusion is 0.25mm (0.010 inch) per side.
6. Dimension B does not include dambar protrusion. Allowable dambar protrusion shall be 0.08mm (0.003 inch) total.
7. "N" is the number of terminal positions.

Thin Plastic Quad Flatpack Packages (TQFP)



Q48.7x7 (JEDEC MO-136AE ISSUE C)
48 LEAD THIN PLASTIC QUAD FLATPACK PACKAGE

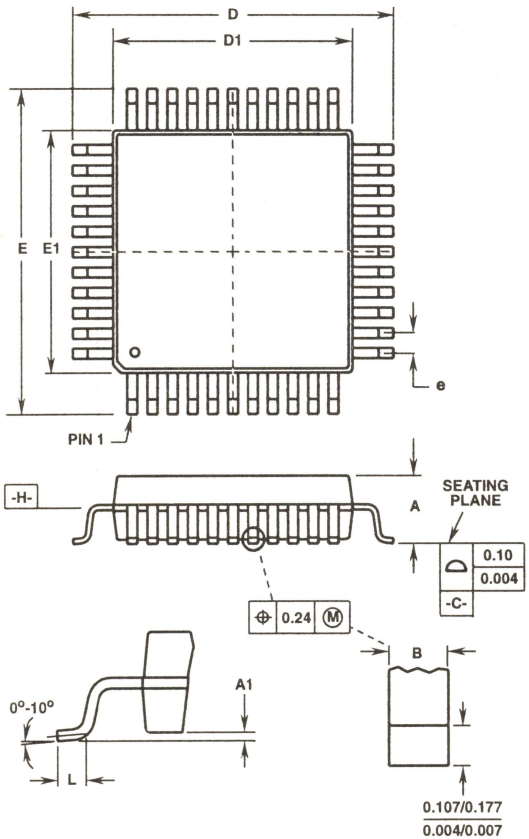
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.047	-	1.20	-
A1	0.002	0.005	0.05	0.15	-
A2	0.038	0.041	0.95	1.05	-
B	0.007	0.010	0.17	0.27	6
B1	0.007	0.009	0.17	0.23	-
D	0.347	0.362	8.80	9.20	3
D1	0.268	0.283	6.80	7.20	4, 5
E	0.347	0.362	8.80	9.20	3
E1	0.268	0.283	6.80	7.20	4, 5
L	0.018	0.029	0.45	0.75	-
N	48		48		7
e	0.020 BSC		0.50 BSC		-

Rev. 0 4/95

NOTES:

1. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.
2. All dimensions and tolerances per ANSI Y14.5M-1982.
3. Dimensions D and E to be determined at seating plane -C-.
4. Dimensions D1 and E1 to be determined at datum plane -H-.
5. Dimensions D1 and E1 do not include mold protrusion. Allowable protrusion is 0.25mm (0.010 inch) per side.
6. Dimension B does not include dambar protrusion. Allowable dambar protrusion shall not cause the lead width to exceed the maximum B dimension by more than 0.08mm (0.003 inch).
7. "N" is the number of terminal positions.

Metric Plastic Quad Flatpack Packages (MQFP)



Q48.7x7-S

48 LEAD METRIC PLASTIC QUAD FLATPACK PACKAGE

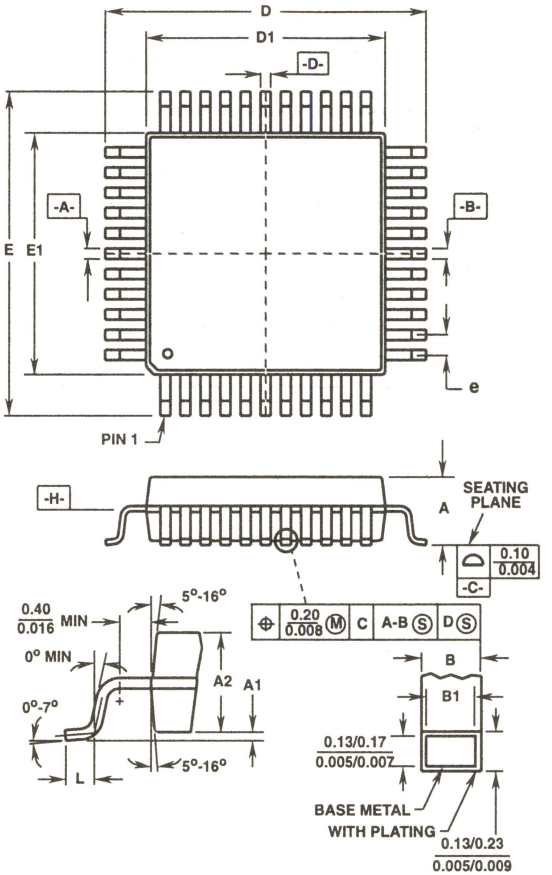
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.056	0.066	1.40	1.70	-
A1	0.000	0.007	0.00	0.20	-
B	0.006	0.010	0.15	0.26	5
D	0.347	0.362	8.80	9.20	2
D1	0.272	0.279	6.90	7.10	3, 4
E	0.347	0.362	8.80	9.20	2
E1	0.272	0.279	6.90	7.10	3, 4
L	0.012	0.027	0.30	0.70	-
N	48		48		6
e	0.020 BSC		0.500 BSC		-

Rev. 1 4/95

NOTES:

1. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.
2. Dimensions D and E to be determined at seating plane -C-.
3. Dimensions D1 and E1 to be determined at datum plane -H-.
4. Dimensions D1 and E1 do not include mold protrusion.
5. Dimension B does not include dambar protrusion.
6. "N" is the number of terminal positions.

Metric Plastic Quad Flatpack Packages (MQFP)



Q64.14x14 (JEDEC MO-108BD-2 ISSUE A)
64 LEAD METRIC PLASTIC QUAD FLATPACK PACKAGE

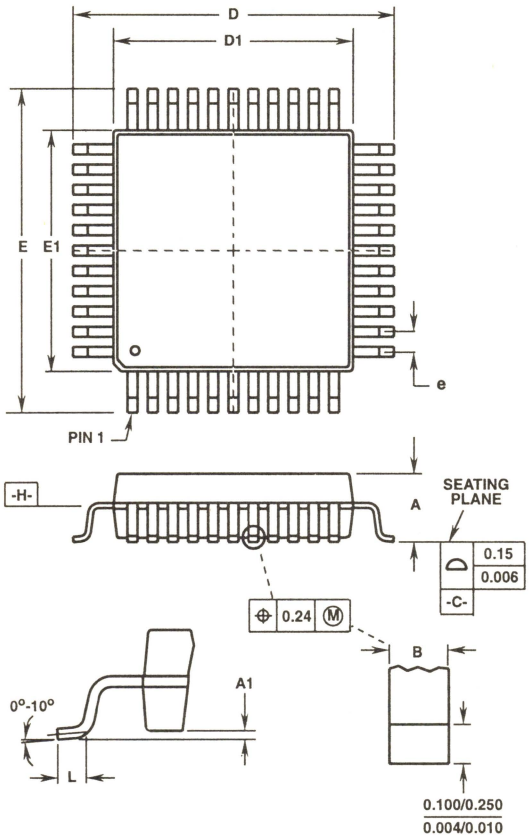
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.130	-	3.30	-
A1	0.004	0.010	0.10	0.25	-
A2	0.100	0.120	2.55	3.05	-
B	0.012	0.018	0.30	0.45	6
B1	0.012	0.016	0.30	0.40	-
D	0.667	0.687	16.95	17.45	3
D1	0.547	0.555	13.90	14.10	4, 5
E	0.667	0.687	16.95	17.45	3
E1	0.547	0.555	13.90	14.10	4, 5
L	0.026	0.037	0.65	0.95	-
N	64		64		7
e	0.032 BSC		0.80 BSC		-

Rev. 0 1/94

NOTES:

1. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.
2. All dimensions and tolerances per ANSI Y14.5M-1982.
3. Dimensions D and E to be determined at seating plane -C-.
4. Dimensions D1 and E1 to be determined at datum plane -H-.
5. Dimensions D1 and E1 do not include mold protrusion. Allowable protrusion is 0.25mm (0.010 inch) per side.
6. Dimension B does not include dambar protrusion. Allowable dambar protrusion shall be 0.08mm (0.003 inch) total.
7. "N" is the number of terminal positions.

Metric Plastic Quad Flatpack Packages (MQFP)



Q64.14x20-S

64 LEAD METRIC PLASTIC QUAD FLATPACK PACKAGE

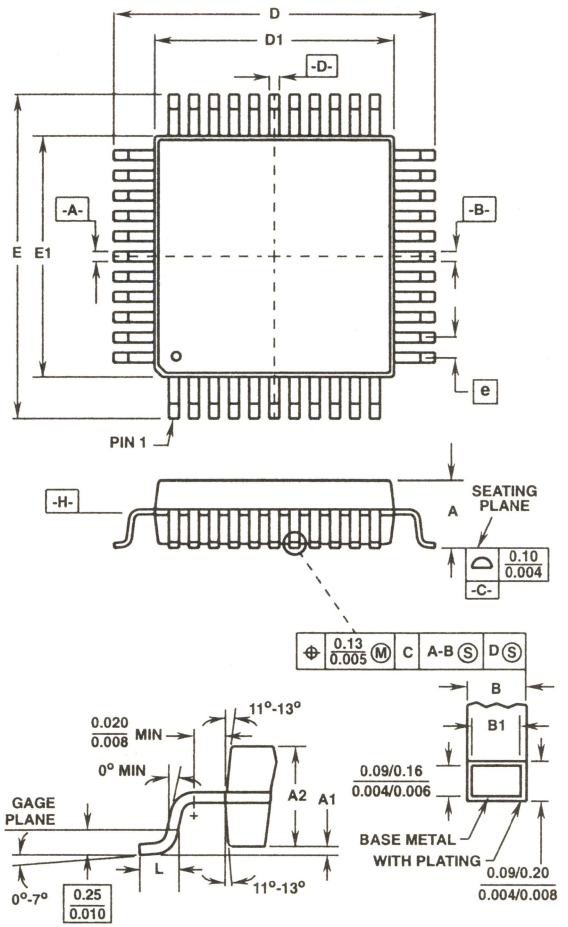
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.103	0.122	2.60	3.10	-
A1	0.002	0.011	0.05	0.30	-
B	0.012	0.021	0.30	0.55	5
D	0.926	0.956	23.50	24.30	2
D1	0.784	0.803	19.90	20.40	3, 4
E	0.689	0.720	17.50	18.30	2
E1	0.548	0.566	13.90	14.40	3, 4
L	0.024	0.039	0.60	1.00	-
N	64		64		6
e	0.039 BSC		1.00 BSC		-
ND	19		19		-
NE	13		13		-

Rev. 1 4/95

NOTES:

1. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.
2. Dimensions D and E to be determined at seating plane -C-.
3. Dimensions D1 and E1 to be determined at datum plane -H-.
4. Dimensions D1 and E1 do not include mold protrusion.
5. Dimension B does not include dambar protrusion.
6. "N" is the number of terminal positions.

Thin Plastic Quad Flatpack Packages (TQFP)



Q80.14x14 (JEDEC MO-136BQ ISSUE C)
80 LEAD THIN PLASTIC QUAD FLATPACK PACKAGE

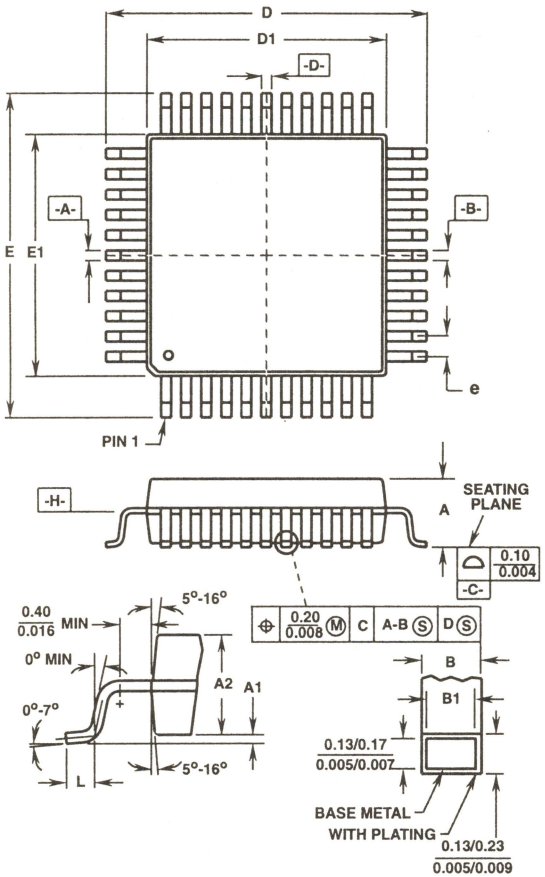
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.062	-	1.60	-
A1	0.002	0.005	0.05	0.15	-
A2	0.054	0.057	1.35	1.45	-
B	0.009	0.014	0.22	0.38	6
B1	0.009	0.012	0.22	0.33	-
D	0.623	0.637	15.80	16.20	3
D1	0.544	0.559	13.80	14.20	4, 5
E	0.623	0.637	15.80	16.20	3
E1	0.544	0.559	13.80	14.20	4, 5
L	0.018	0.029	0.45	0.75	-
N	80		80		7
e	0.026 BSC		0.65 BSC		-

Rev. 1 4/95

NOTES:

1. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.
2. All dimensions and tolerances per ANSI Y14.5M-1982.
3. Dimensions D and E to be determined at seating plane -C-.
4. Dimensions D1 and E1 to be determined at datum plane -H-.
5. Dimensions D1 and E1 do not include mold protrusion. Allowable protrusion is 0.25mm (0.010 inch) per side.
6. Dimension B does not include dambar protrusion. Allowable dambar protrusion shall not cause the lead width to exceed the maximum B dimension by more than 0.08mm (0.003 inch).
7. "N" is the number of terminal positions.

Metric Plastic Quad Flatpack Packages (MQFP)



Q80.14x20 (JEDEC MO-108CB-1 ISSUE A)
80 LEAD METRIC PLASTIC QUAD FLATPACK PACKAGE

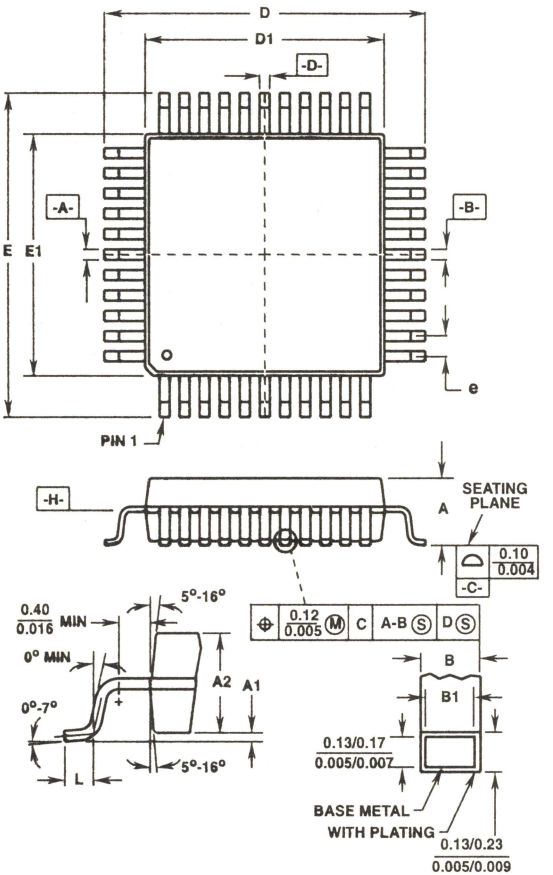
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.134	-	3.40	-
A1	0.010	-	0.25	-	-
A2	0.100	0.120	2.55	3.05	-
B	0.012	0.018	0.30	0.45	6
B1	0.012	0.016	0.30	0.40	-
D	0.904	0.923	22.95	23.45	3
D1	0.783	0.791	19.90	20.10	4, 5
E	0.667	0.687	16.95	17.45	3
E1	0.547	0.555	13.90	14.10	4, 5
L	0.026	0.037	0.65	0.95	-
N	80		80		7
e	0.032 BSC		0.80 BSC		-
ND	24		24		-
NE	16		16		-

Rev. 0 1/94

NOTES:

1. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.
2. All dimensions and tolerances per ANSI Y14.5M-1982.
3. Dimensions D and E to be determined at seating plane -C-.
4. Dimensions D1 and E1 to be determined at datum plane -H-.
5. Dimensions D1 and E1 do not include mold protrusion. Allowable protrusion is 0.25mm (0.010 inch) per side.
6. Dimension B does not include dambar protrusion. Allowable dambar protrusion shall be 0.08mm (0.003 inch) total.
7. "N" is the number of terminal positions.

Metric Plastic Quad Flatpack Packages (MQFP)



Q100.14x20 (JEDEC MO-108CC-1 ISSUE A)
100 LEAD METRIC PLASTIC QUAD FLATPACK PACKAGE

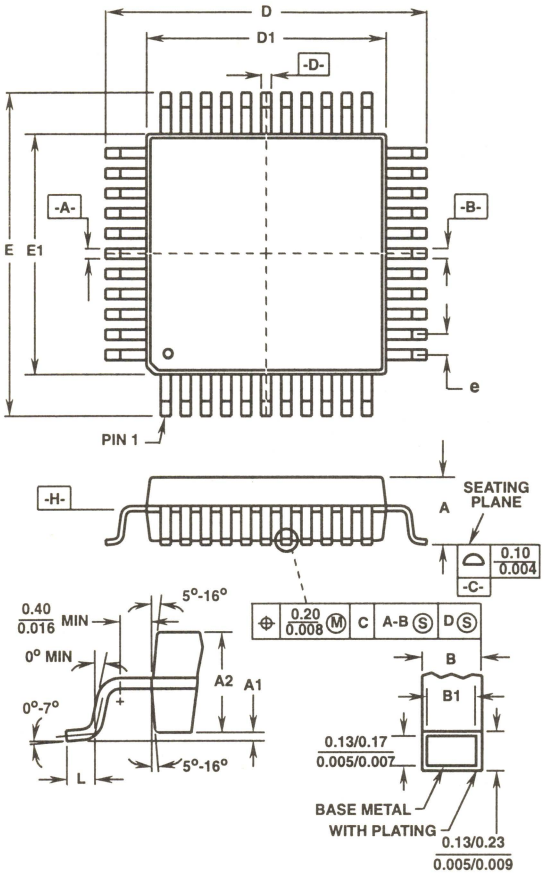
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.134	-	3.40	-
A1	0.010	-	0.25	-	-
A2	0.100	0.120	2.55	3.05	-
B	0.009	0.015	0.22	0.38	6
B1	0.009	0.013	0.22	0.33	-
D	0.904	0.923	22.95	23.45	3
D1	0.783	0.791	19.90	20.10	4, 5
E	0.667	0.687	16.95	17.45	3
E1	0.547	0.555	13.90	14.10	4, 5
L	0.026	0.037	0.65	0.95	-
N	100		100		7
e	0.026 BSC		0.65 BSC		-
ND	30		30		-
NE	20		20		-

Rev. 0 1/94

NOTES:

1. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.
2. All dimensions and tolerances per ANSI Y14.5M-1982.
3. Dimensions D and E to be determined at seating plane -C-.
4. Dimensions D1 and E1 to be determined at datum plane -H-.
5. Dimensions D1 and E1 do not include mold protrusion. Allowable protrusion is 0.25mm (0.010 inch) per side.
6. Dimension B does not include dambar protrusion. Allowable dambar protrusion shall be 0.08mm (0.003 inch) total.
7. "N" is the number of terminal positions.

Metric Plastic Quad Flatpack Packages (MQFP)



Q120.28x28 (JEDEC MO-108DA-1 ISSUE A)
120 LEAD METRIC PLASTIC QUAD FLATPACK PACKAGE

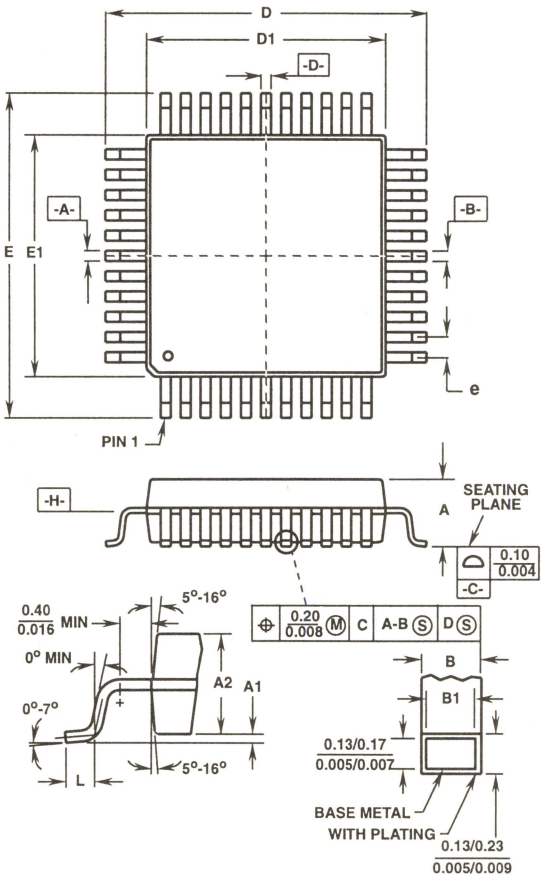
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.160	-	4.07	-
A1	0.010	-	0.25	-	-
A2	0.125	0.144	3.17	3.67	-
B	0.012	0.018	0.30	0.45	6
B1	0.012	0.016	0.30	0.40	-
D	1.219	1.238	30.95	31.45	3
D1	1.098	1.106	27.90	28.10	4, 5
E	1.219	1.238	30.95	31.45	3
E1	1.098	1.106	27.90	28.10	4, 5
L	0.026	0.037	0.65	0.95	-
N	120		120		7
e	0.032 BSC		0.80 BSC		-

Rev. 0 1/94

NOTES:

1. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.
2. All dimensions and tolerances per ANSI Y14.5M-1982.
3. Dimensions D and E to be determined at seating plane -C-.
4. Dimensions D1 and E1 to be determined at datum plane -H-.
5. Dimensions D1 and E1 do not include mold protrusion. Allowable protrusion is 0.25mm (0.010 inch) per side.
6. Dimension B does not include dambar protrusion. Allowable dambar protrusion shall be 0.08mm (0.003 inch) total.
7. "N" is the number of terminal positions.

Metric Plastic Quad Flatpack Packages (MQFP)



Q128.28x28 (JEDEC MO-108DB-1 ISSUE A)
128 LEAD METRIC PLASTIC QUAD FLATPACK PACKAGE

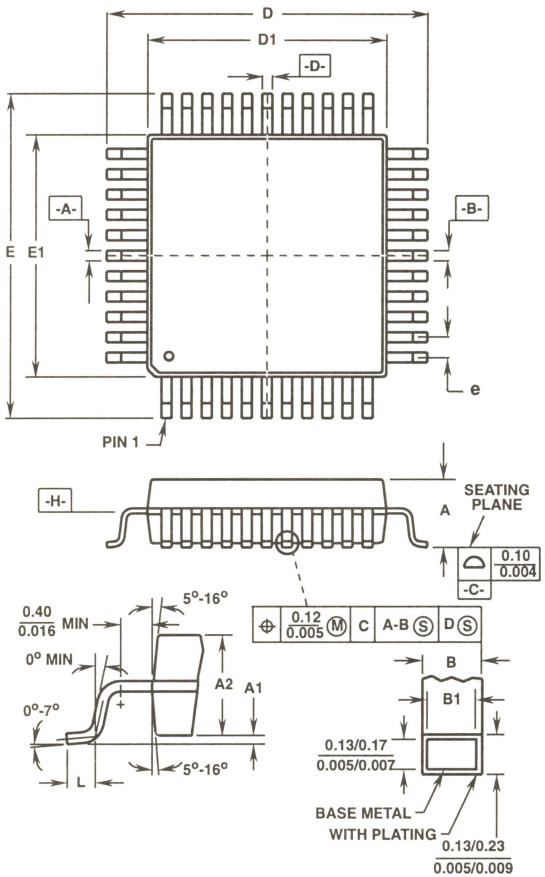
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.160	-	4.07	-
A1	0.010	-	0.25	-	-
A2	0.125	0.144	3.17	3.67	-
B	0.012	0.018	0.30	0.45	6
B1	0.012	0.016	0.30	0.40	-
D	1.219	1.238	30.95	31.45	3
D1	1.098	1.106	27.90	28.10	4, 5
E	1.219	1.238	30.95	31.45	3
E1	1.098	1.106	27.90	28.10	4, 5
L	0.026	0.037	0.65	0.95	-
N	128		128		7
e	0.032 BSC		0.80 BSC		-

Rev. 0 1/94

NOTES:

1. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.
2. All dimensions and tolerances per ANSI Y14.5M-1982.
3. Dimensions D and E to be determined at seating plane -C-.
4. Dimensions D1 and E1 to be determined at datum plane -H-.
5. Dimensions D1 and E1 do not include mold protrusion. Allowable protrusion is 0.25mm (0.010 inch) per side.
6. Dimension B does not include dambar protrusion. Allowable dambar protrusion shall be 0.08mm (0.003 inch) total.
7. "N" is the number of terminal positions.

Metric Plastic Quad Flatpack Packages (MQFP)



Q144.28x28 (JEDEC MO-108DC-1 ISSUE A)
144 LEAD METRIC PLASTIC QUAD FLATPACK PACKAGE

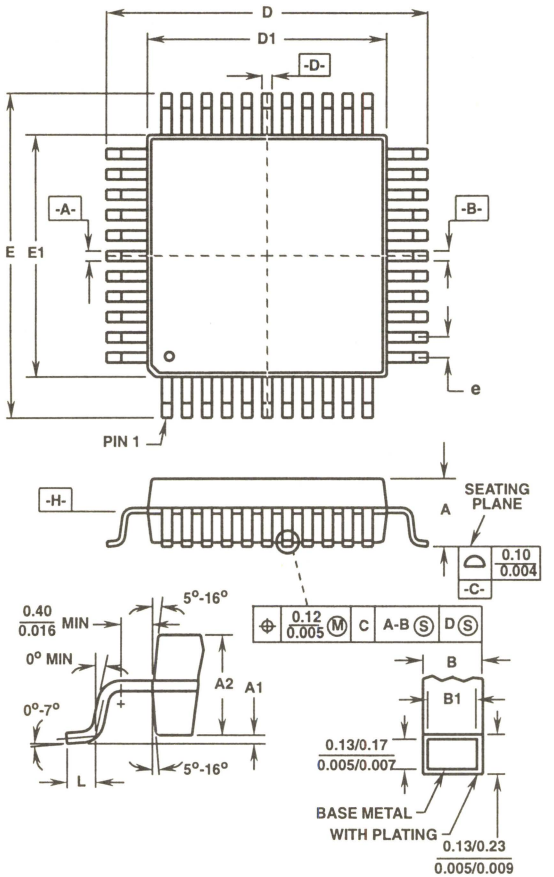
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.160	-	4.07	-
A1	0.010	-	0.25	-	-
A2	0.125	0.144	3.17	3.67	-
B	0.009	0.015	0.22	0.38	6
B1	0.009	0.013	0.22	0.33	-
D	1.219	1.238	30.95	31.45	3
D1	1.098	1.106	27.90	28.10	4, 5
E	1.219	1.238	30.95	31.45	3
E1	1.098	1.106	27.90	28.10	4, 5
L	0.026	0.037	0.65	0.95	-
N	144		144		7
e	0.026 BSC		0.65 BSC		-

Rev. 0 1/94

NOTES:

1. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.
2. All dimensions and tolerances per ANSI Y14.5M-1982.
3. Dimensions D and E to be determined at seating plane -C-.
4. Dimensions D1 and E1 to be determined at datum plane -H-.
5. Dimensions D1 and E1 do not include mold protrusion. Allowable protrusion is 0.25mm (0.010 inch) per side.
6. Dimension B does not include dambar protrusion. Allowable dambar protrusion shall be 0.08mm (0.003 inch) total.
7. "N" is the number of terminal positions.

Metric Plastic Quad Flatpack Packages (MQFP)



Q160.28x28 (JEDEC MO-108DD-1 ISSUE A)
160 LEAD METRIC PLASTIC QUAD FLATPACK PACKAGE

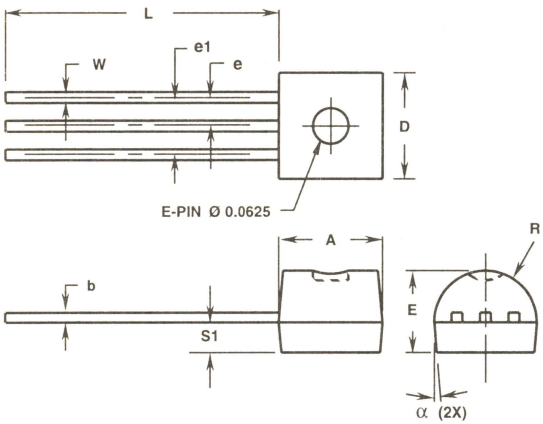
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.160	-	4.07	-
A1	0.010	-	0.25	-	-
A2	0.125	0.144	3.17	3.67	-
B	0.009	0.015	0.22	0.38	6
B1	0.009	0.013	0.22	0.33	-
D	1.219	1.238	30.95	31.45	3
D1	1.098	1.106	27.90	28.10	4, 5
E	1.219	1.238	30.95	31.45	3
E1	1.098	1.106	27.90	28.10	4, 5
L	0.026	0.037	0.65	0.95	-
N	160		160		7
e	0.026 BSC		0.65 BSC		-

Rev. 0 1/94

NOTES:

1. Controlling dimension: MILLIMETER. Converted inch dimensions are not necessarily exact.
2. All dimensions and tolerances per ANSI Y14.5M-1982.
3. Dimensions D and E to be determined at seating plane -C-.
4. Dimensions D1 and E1 to be determined at datum plane -H-.
5. Dimensions D1 and E1 do not include mold protrusion. Allowable protrusion is 0.25mm (0.010 inch) per side.
6. Dimension B does not include dambar protrusion. Allowable dambar protrusion shall be 0.08mm (0.003 inch) total.
7. "N" is the number of terminal positions.

Single-In-Line Plastic Packages (SIP)



Z3.05 (JEDEC STYLE TO-92 MODIFIED)
3 LEAD PLASTIC SINGLE-IN-LINE PACKAGE

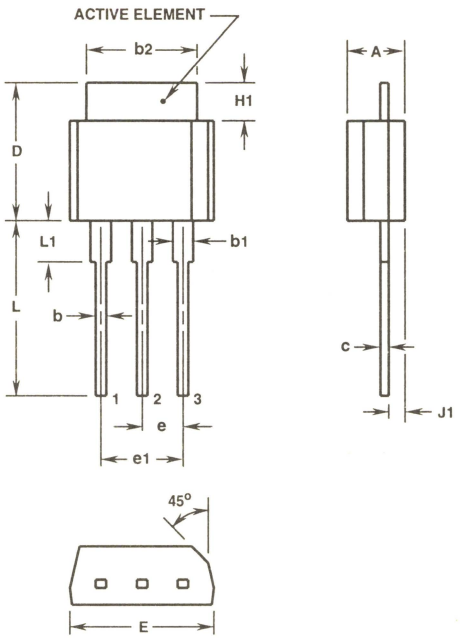
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.170	0.195	4.32	4.95	1
b	0.014	0.020	0.36	0.51	2
E	0.130	0.155	3.30	3.94	1
e	0.045	0.055	1.14	1.40	-
e1	0.095	0.105	2.41	2.67	-
L	0.500	0.610	12.70	15.49	-
R	0.085	0.095	2.16	2.41	-
S1	0.045	0.060	1.14	1.52	-
W	0.016	0.022	0.41	0.56	2
D	0.175	0.195	4.45	4.95	1
α	4^o	6^o	4^o	6^o	-

Rev. 0 2/94

NOTES:

1. Package body dimensions do not include any mold flash or protrusions.
2. Package outline dimensions do not include burrs.
3. Controlling dimension: INCH.

Single-In-Line Plastic Packages (SIP)



Z3.1A (JEDEC STYLE TO-202 MODIFIED)
3 LEAD SHORT TAB SINGLE-IN-LINE PLASTIC PACKAGE

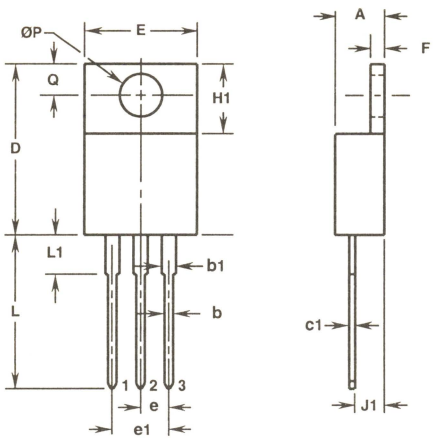
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.130	0.150	3.31	3.81	-
b	0.024	0.028	0.61	0.71	2, 3
b1	0.045	0.055	1.15	1.39	1, 2, 3
b_2	0.270	0.280	6.86	7.11	-
c	0.018	0.022	0.46	0.55	1, 2, 3
D	0.320	0.340	8.13	8.63	-
E	0.340	0.360	8.64	9.14	-
e	0.100 TYP		2.54 TYP		4
e1	0.200 BSC		5.08 BSC		4
H1	0.080	0.100	2.04	2.54	-
J1	0.039	0.049	1.00	1.24	5
L	0.410	0.440	10.42	11.17	-
L1	0.080	0.100	2.04	2.54	1

Rev. 1 2/95

NOTES:

1. Lead dimension and finish uncontrolled in zone L1.
2. Lead dimension (without solder).
3. Add typically 0.002 inches (0.05mm) for solder coating.
4. Position of lead to be measured 0.250 inches (6.35mm) from bottom of dimension D.
5. Position of lead to be measured 0.100 inches (2.54mm) from bottom of dimension D.
6. Controlling dimension: INCH.

Single-In-Line Plastic Packages (SIP)



Z3.1B

3 LEAD PLASTIC SINGLE-IN-LINE PACKAGE

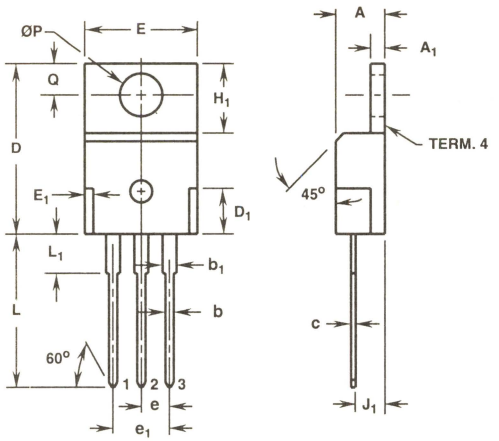
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.140	0.190	3.56	4.82	-
b	0.015	0.040	0.38	1.02	-
b1	0.045	0.070	1.14	1.77	1
c1	0.014	0.022	0.36	0.56	1
D	0.560	0.650	14.23	16.51	-
E	0.380	0.420	9.66	10.66	-
e	0.090	0.110	2.29	2.79	2
e1	0.190	0.210	4.83	5.33	2
F	0.020	0.055	0.51	1.39	-
H1	0.230	0.270	5.85	6.85	-
J1	0.080	0.115	2.04	2.92	3
L	0.500	0.580	12.70	14.73	-
L1	-	0.250	-	6.35	1
ØP	0.139	0.161	3.53	4.08	-
Q	0.100	0.135	2.54	3.43	-

Rev. 1 2/95

NOTES:

1. Lead dimension and finish uncontrolled in zone L1.
2. Position of lead to be measured 0.250 inches (6.35mm) from bottom of dimension D.
3. Position of lead to be measured 0.100 inches (2.54mm) from bottom of dimension D.
4. Controlling dimension: INCH.

Single-In-Line Plastic Packages (SIP)



Z3.1C (JEDEC TO-220AB ISSUE J)
3 LEAD PLASTIC SINGLE-IN-LINE PACKAGE

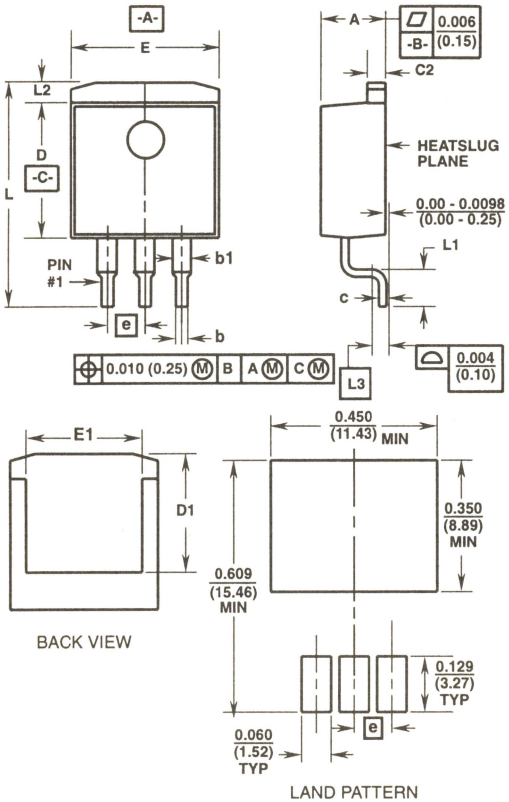
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.170	0.180	4.32	4.57	-
A_1	0.048	0.052	1.22	1.32	-
b	0.030	0.034	0.77	0.86	3, 4
b_1	0.045	0.055	1.15	1.39	2, 3
c	0.014	0.019	0.36	0.48	2, 3, 4
D	0.590	0.610	14.99	15.49	-
D_1	-	0.160	-	4.06	-
E	0.395	0.410	10.04	10.41	-
E_1	-	0.030	-	0.76	-
e	0.100 TYP		2.54 TYP		5
e_1	0.200 BSC		5.08 BSC		5
H_1	0.235	0.255	5.97	6.47	-
J_1	0.100	0.110	2.54	2.79	6
L	0.530	0.550	13.47	13.97	-
L_1	0.130	0.150	3.31	3.81	2
ØP	0.149	0.153	3.79	3.88	-
Q	0.102	0.112	2.60	2.84	-

Rev. 0 2/95

NOTES:

1. These dimensions are within allowable dimensions of Issue J of JEDEC TO-220AB outline dated 3-24-87.
2. Lead dimension and finish uncontrolled in L_1.
3. Lead dimension (without solder).
4. Add typically 0.002 inches (0.05mm) for solder coating.
5. Position of lead to be measured 0.250 inches (6.35mm) from bottom of dimension D.
6. Position of lead to be measured 0.100 inches (2.54mm) from bottom of dimension D.
7. Controlling dimension: Inch.

Single-In-Line Plastic Packages (SIP)



Z3.1D

3 LEAD PLASTIC SINGLE-IN-LINE PACKAGE SURFACE MOUNT "GULLWING" LEAD FORM

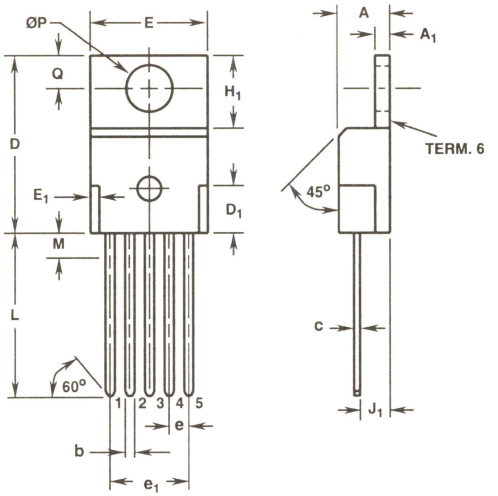
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.170	0.180	4.32	4.57	-
C2	0.048	0.055	1.22	1.39	5
D	0.350	0.370	8.89	9.39	-
E	0.395	0.405	10.04	10.28	-
D1	0.310	-	7.88	-	-
E1	0.310	-	7.88	-	-
L	0.549	0.569	13.95	14.45	-
L1	0.068	0.088	1.72	2.24	-
L2	0.045	0.055	1.15	1.40	-
L3	0.030 BSC		0.76 BSC		4
b	0.030	0.037	0.77	0.94	5, 6
b1	0.045	0.054	1.15	1.37	5, 7
c	0.018	0.024	0.46	0.60	5
e	0.100 BSC		2.54 BSC		-

Rev. 0 3/95

NOTES:

1. These package dimensions are within allowable dimensions of JEDEC MO-169AA, Issue A.
2. Controlling dimension: Inch.
3. Dimensioning and tolerance per ANSI Y14.5M-1982.
4. Gauge plane L3 is parallel to heatslug plane.
5. Dimensions include lead finish.
6. Leads are not allowed above the datum -B-.
7. Dimension "b1" does not include dambar protrusion. Allowable dambar protrusion shall not cause the lead width to exceed the maximum "b1" by more than 0.003" (0.08mm).

Single-In-Line Plastic Packages (SIP)



Z5.067 (JEDEC TS-001AA ISSUE A)
5 LEAD PLASTIC SINGLE-IN-LINE PACKAGE

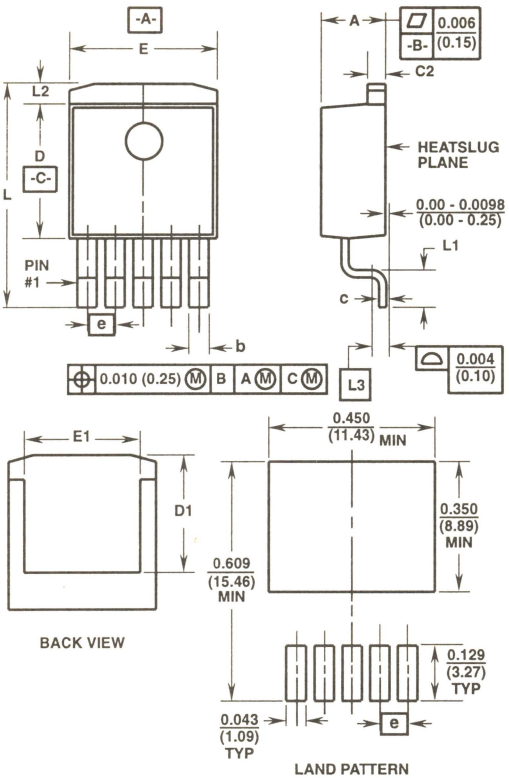
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.170	0.180	4.32	4.57	-
A_1	0.048	0.052	1.22	1.32	-
b	0.030	0.034	0.77	0.86	3, 4
c	0.014	0.019	0.36	0.48	2, 3, 4
D	0.590	0.610	14.99	15.49	-
D_1	-	0.160	-	4.06	-
E	0.395	0.410	10.04	10.41	-
E_1	-	0.030	-	0.76	-
e	0.067 TYP		1.70 TYP		5
e_1	0.268 BSC		6.80 BSC		5
H_1	0.235	0.255	5.97	6.47	-
J_1	0.100	0.110	2.54	2.79	6
L	0.530	0.550	13.47	13.97	-
M	0.130	0.150	3.31	3.81	2
ØP	0.149	0.153	3.79	3.88	-
Q	0.102	0.112	2.60	2.84	-

Rev. 1 2/95

NOTES:

1. These dimensions are within allowable dimensions of Issue A of JEDEC TS-001AA outline dated 8-89.
2. Lead finish uncontrolled in zone M.
3. Lead dimension (without solder).
4. Add typically 0.002 inches (0.05mm) for solder coating.
5. Position of lead to be measured 0.250 inches (6.35mm) from bottom of dimension D.
6. Position of lead to be measured 0.100 inches (2.54mm) from bottom of dimension D.
7. Controlling dimension: Inch.

Single-In-Line Plastic Packages (SIP)



Z5.067A

5 LEAD PLASTIC SINGLE-IN-LINE PACKAGE SURFACE MOUNT "GULLWING" LEAD FORM

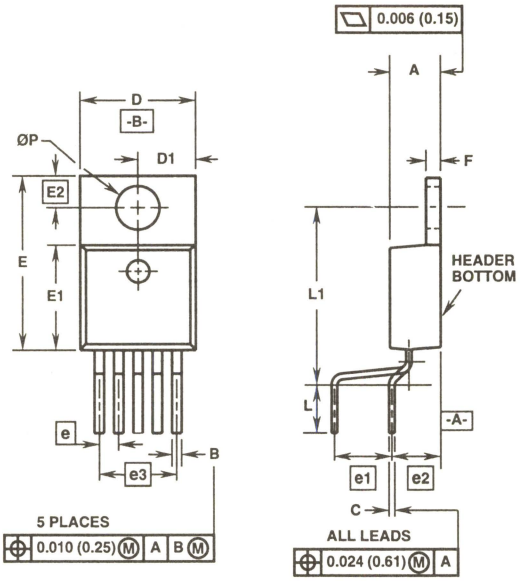
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.170	0.180	4.32	4.57	-
C2	0.048	0.055	1.22	1.39	5
D	0.350	0.370	8.89	9.39	-
E	0.395	0.405	10.04	10.28	-
D1	0.310	-	7.88	-	-
E1	0.310	-	7.88	-	-
L	0.549	0.569	13.95	14.45	-
L1	0.068	0.088	1.72	2.24	-
L2	0.045	0.055	1.15	1.40	-
L3	0.030 BSC		0.76 BSC		4
b	0.030	0.037	0.77	0.94	5, 6, 7
c	0.018	0.024	0.46	0.60	5
e	0.067 BSC		1.70 BSC		-

Rev. 0 3/95

NOTES:

1. These package dimensions are within allowable dimensions of JEDEC MO-169AB, Issue A.
2. Controlling dimension: Inch.
3. Dimensioning and tolerance per ANSI Y14.5M-1982.
4. Gauge plane L3 is parallel to heatslug plane.
5. Dimensions include lead finish.
6. Leads are not allowed above the datum -B-.
7. Dimension "b" does not include dambar protrusion. Allowable dambar protrusion shall not cause the lead width to exceed the maximum "b" by more than 0.003" (0.08mm).

Single-In-Line Plastic Packages (SIP)



Z5.067B

5 LEAD PLASTIC SINGLE-IN-LINE PACKAGE
STAGGERED VERTICAL LEAD FORM

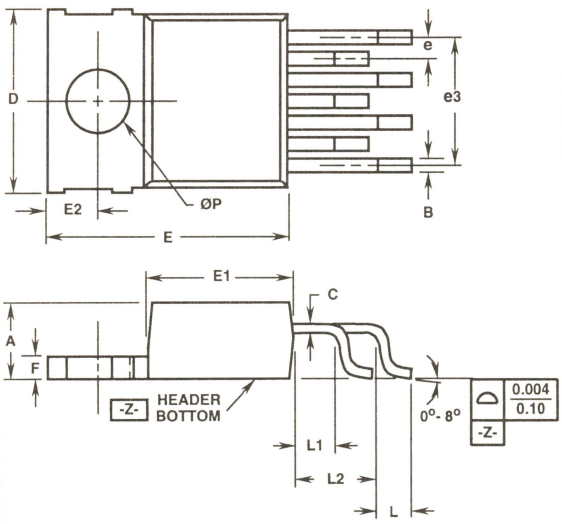
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.170	0.180	4.32	4.57	-
B	0.030	0.037	0.77	0.94	3, 4
C	0.018	0.024	0.46	0.60	3
D	0.395	0.405	10.04	10.28	-
D1	0.198	0.202	5.03	5.13	-
E	0.595	0.605	15.11	15.37	-
E1	0.350	0.370	8.89	9.39	-
E2	0.110 BSC		2.79 BSC		
e	0.067 BSC		1.70 BSC		-
e1	0.200 BSC		5.08 BSC		-
e2	0.169 BSC		4.29 BSC		-
e3	0.268 BSC		6.80 BSC		-
F	0.048	0.055	1.22	1.39	3
L	0.150	0.176	3.81	4.47	-
L1	0.600	0.620	15.24	15.74	-
ØP	0.147	0.152	3.73	3.86	3

Rev. 0 6/95

NOTES:

1. Controlling dimension: INCH.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Dimensions include lead finish.
4. Dimension "B" does not include dambar protrusion. Allowable dambar protrusion shall not cause lead width to exceed maximum "B" by more than 0.003 inches (0.08mm).

Single-In-Line Plastic Packages (SIP)



Z7.05A

7 LEAD PLASTIC SINGLE-IN-LINE PACKAGE
STAGGERED SURFACE MOUNT "GULLWING" LEAD FORM

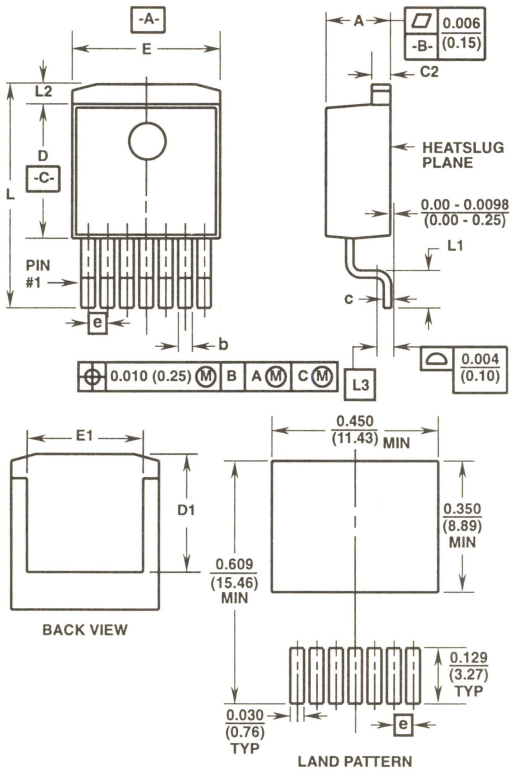
SYMBOL	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.160	0.190	4.06	4.83
B	0.023	0.037	0.58	0.94
C	0.015	0.023	0.38	0.58
D	0.385	0.415	9.78	10.54
E	0.560	0.590	14.22	14.99
E1	0.326	0.335	8.28	8.50
E2	0.103	0.113	2.62	2.87
e	0.045	0.055	1.14	1.40
e3	0.295	0.305	7.49	7.75
F	0.045	0.055	1.14	1.40
L	0.065	0.080	1.66	2.03
L1	0.100	0.110	2.54	2.79
L2	0.200	0.210	5.08	5.33
N	7		7	
ØP	0.145	0.156	3.68	3.98

Rev. 0 2/94

NOTES:

1. Dimensioning and tolerancing per ANSI Y14.5M, 1982.
2. N is the number of leads.
3. Controlling dimension: INCH.

Single-In-Line Plastic Packages (SIP)



Z7.05B

7 LEAD PLASTIC SINGLE-IN-LINE PACKAGE SURFACE MOUNT "GULLWING" LEAD FORM

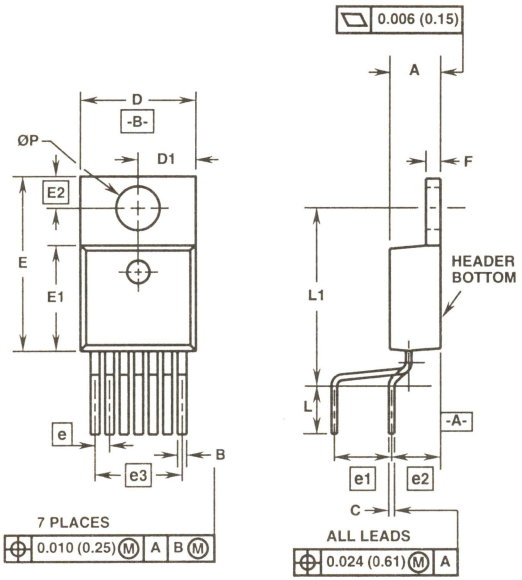
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.170	0.180	4.32	4.57	-
C2	0.048	0.055	1.22	1.39	5
D	0.350	0.370	8.89	9.39	-
E	0.395	0.405	10.04	10.28	-
D1	0.310	-	7.88	-	-
E1	0.310	-	7.88	-	-
L	0.549	0.569	13.95	14.45	-
L1	0.068	0.088	1.72	2.24	-
L2	0.045	0.055	1.15	1.40	-
L3	0.030 BSC		0.76 BSC		4
b	0.028	0.034	0.71	0.86	5, 6, 7
c	0.018	0.024	0.46	0.60	5
e	0.050 BSC		1.27 BSC		-

Rev. 1 3/95

NOTES:

1. These package dimensions are within allowable dimensions of JEDEC MO-169AC, Issue A.
2. Controlling dimension: Inch.
3. Dimensioning and tolerance per ANSI Y14.5M-1982.
4. Gauge plane L3 is parallel to heatslug plane.
5. Dimensions include lead finish.
6. Leads are not allowed above the datum -B-.
7. Dimension "b" does not include dambar protrusion. Allowable dambar protrusion shall not cause the lead width to exceed the maximum "b" by more than 0.003" (0.08mm).

Single-In-Line Plastic Packages (SIP)



Z7.05C

7 LEAD PLASTIC SINGLE-IN-LINE PACKAGE
STAGGERED VERTICAL LEAD FORM

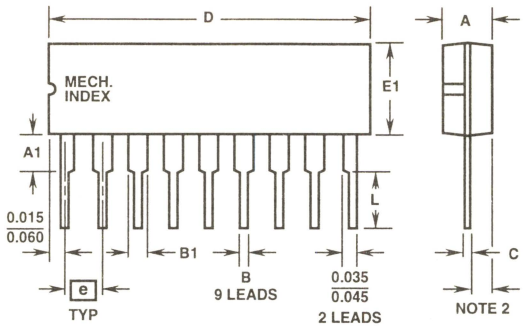
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.170	0.180	4.32	4.57	-
B	0.028	0.034	0.71	0.86	3, 4
C	0.018	0.024	0.46	0.60	3
D	0.395	0.405	10.04	10.28	-
D1	0.198	0.202	5.03	5.13	-
E	0.595	0.605	15.11	15.37	-
E1	0.350	0.370	8.89	9.39	-
E2	0.110 BSC		2.79 BSC		
e	0.050 BSC		1.27 BSC		-
e1	0.200 BSC		5.08 BSC		-
e2	0.169 BSC		4.29 BSC		-
e3	0.300 BSC		7.62 BSC		-
F	0.048	0.055	1.22	1.39	3
L	0.150	0.176	3.81	4.47	-
L1	0.600	0.620	15.24	15.74	-
ØP	0.147	0.152	3.73	3.86	3

Rev. 0 6/95

NOTES:

1. Controlling dimension: INCH.
2. Dimensioning and tolerancing per ANSI Y14.5M-1982.
3. Dimensions include lead finish.
4. Dimension "B" does not include dambar protrusion. Allowable dambar protrusion shall not cause lead width to exceed maximum "B" by more than 0.003 inches (0.08mm).

Single-In-Line Plastic Packages (SIP)



Z9.1
9 LEAD SINGLE-IN-LINE PLASTIC PACKAGE

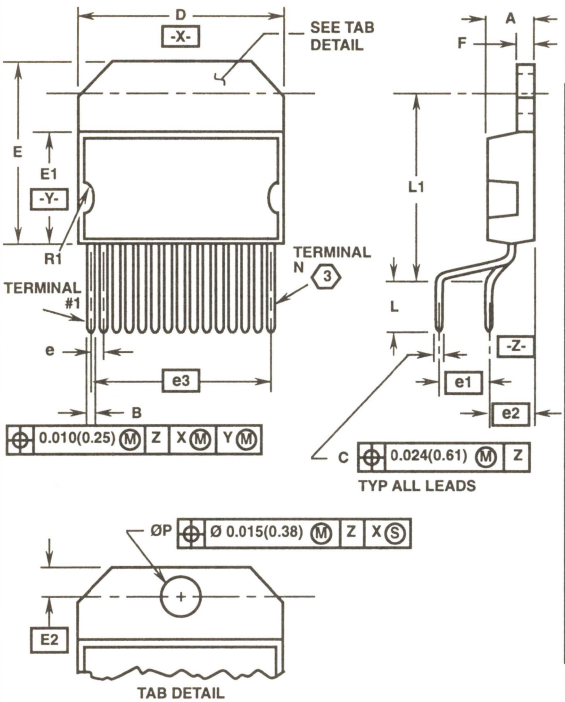
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	-	0.140	-	3.56	-
A1	0.090	0.120	2.29	3.05	-
B	0.014	0.020	0.36	0.51	-
B1	0.050	0.065	1.27	1.65	3
C	0.008	0.014	0.20	0.35	-
D	0.845	0.885	21.47	22.48	2
E1	0.240	0.260	6.10	6.61	2
e	0.100 BSC		2.54 BSC		-
L	0.125	0.150	3.18	3.81	-
N	9		9		4

Rev. 0 2/94

NOTES:

1. Lead within 0.010 inch radius of true position (TP) with maximum material condition.
2. D and E1 dimensions do not include mold flash or protrusions. Mold flash or protrusions shall not exceed 0.010 inch (0.25mm).
3. B1 maximum dimensions do not include dambar protrusions. Dambar protrusions shall not exceed 0.010 inch (0.25mm).
4. N is the maximum number of terminal positions.
5. Controlling dimension: INCH.

Single-In-Line Plastic Packages (SIP)



Z15.05A (JEDEC MO-048 AB ISSUE A)
15 LEAD PLASTIC SINGLE-IN-LINE PACKAGE
STAGGERED VERTICAL LEAD FORM

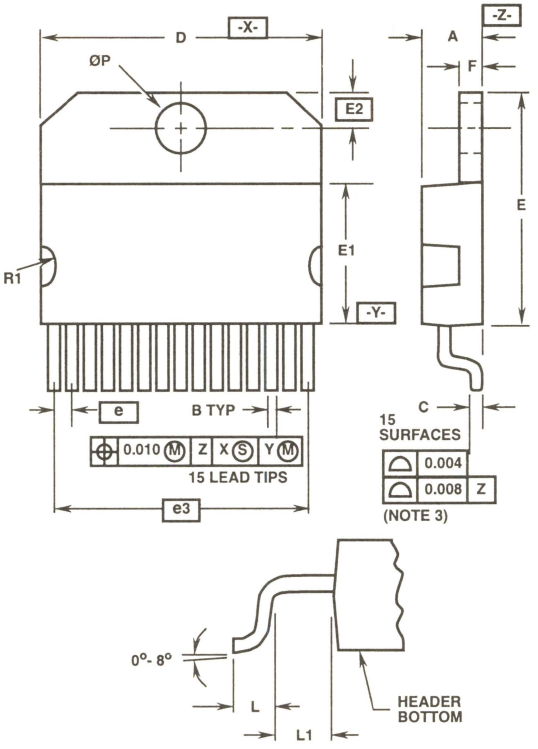
SYMBOL	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.172	0.182	4.37	4.62
B	0.024	0.031	0.61	0.79
C	0.014	0.024	0.36	0.61
D	0.778	0.798	19.76	20.27
E	0.684	0.694	17.37	17.63
E1	0.416	0.426	10.57	10.82
E2	0.110 BSC		2.79 BSC	
e	0.050 BSC		1.27 BSC	
e1	0.200 BSC		5.08 BSC	
e2	0.169 BSC		4.29 BSC	
e3	0.700 BSC		17.78 BSC	
F	0.057	0.063	1.45	1.60
L	0.150	0.176	3.81	4.47
L_1	0.690	0.710	17.53	18.03
N	15		15	
ØP	0.148	0.152	3.76	3.86
R1	0.065	0.080	1.65	2.03

Rev. 0 2/94

NOTES:

1. Refer to series symbol list, JEDEC Publication No. 95.
2. Dimensioning and Tolerancing per ANSI Y14.5M-1982.
3. N is the number of terminals.
4. Controlling dimension: INCH.

Single-In-Line Plastic Packages (SIP)



Z15.05B

15 LEAD PLASTIC SINGLE-IN-LINE PACKAGE
SURFACE MOUNT "GULLWING" LEAD FORM

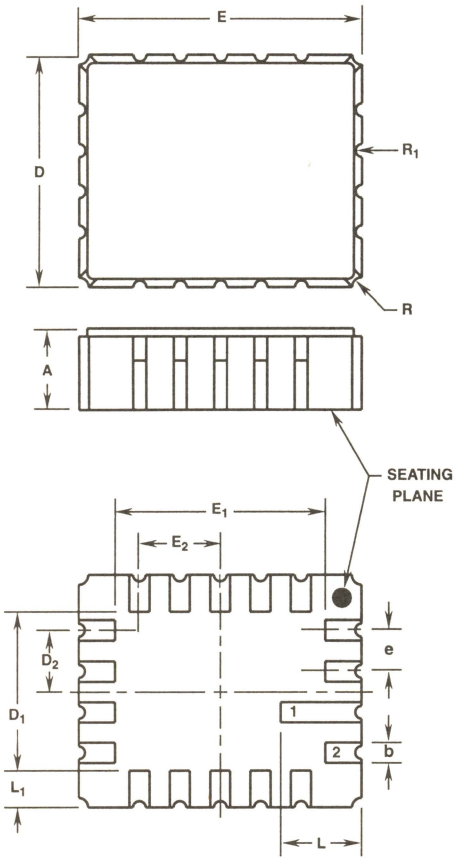
SYMBOL	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.172	0.182	4.37	4.62
B	0.024	0.031	0.61	0.79
C	0.018	0.024	0.46	0.61
D	0.778	0.798	19.76	20.27
E	0.684	0.694	17.37	17.63
E1	0.416	0.426	10.57	10.82
E2	0.110 BSC		2.79 BSC	
e	0.050 BSC		1.27 BSC	
e3	0.700 BSC		17.78 BSC	
F	0.057	0.063	1.45	1.60
L	0.065	0.080	1.66	2.03
L1	0.098	0.108	2.49	2.74
N	15		15	
ØP	0.148	0.152	3.76	3.86
R1	0.065	0.080	1.65	2.03

Rev. 0 2/94

NOTES:

1. Dimensioning and Tolerancing per ANSI Y14.5M - 1982.
2. N is the number of terminals.
3. All lead surfaces are within 0.004 inch of each other. No lead can be more than 0.004 inch above or below the header plane, (-Z- Datum).
4. Controlling dimension: INCH.

Ceramic Packages



18 Pin LCC

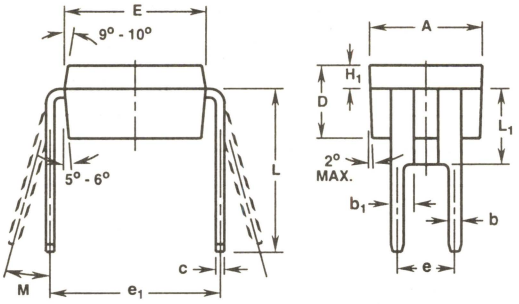
18 PIN CERAMIC LEADLESS CHIP CARRIER

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.092	0.112	2.34	2.84	-
b	0.020	0.030	0.51	0.76	-
D	0.275	0.295	6.99	7.49	-
D_1	0.175	0.215	4.45	5.46	-
D_2	0.070	0.080	1.78	2.03	-
E	0.340	0.360	8.64	9.14	-
E_1	0.240	0.280	6.10	7.11	-
E_2	0.095	0.105	2.42	2.66	-
e	0.050 BSC		1.27 BSC		-
L	0.085	0.115	2.16	2.92	-
L_1	0.035	0.055	0.89	1.39	-
R	0.007	0.017	0.18	0.43	4
R_1	0.003	0.013	0.08	0.33	4

NOTES:

1. No current JEDEC outline for this package.
2. All exposed metallized areas shall be plated with a minimum of 50 microinches of gold over nickel unless otherwise stated.
3. Metallized castellations shall be connected to the seating plane and extend upward toward top of package.
4. Corner shape (notch, radius, square, etc.) may vary at the manufacturer's option.
5. Unless otherwise specified, a minimum clearance of 0.010 inches (0.25mm) shall be maintained between all metallized areas.
6. Controlling dimension: Inch.
7. Revision 1 dated 6-93.

Plastic Packages)



HexDIP

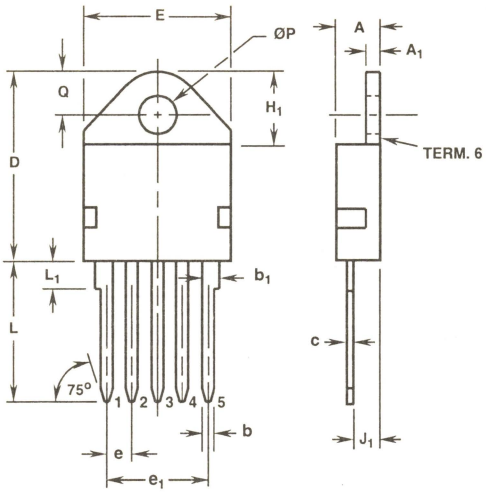
4 PIN DUAL-IN-LINE PLASTIC PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.194	0.198	4.93	5.02	-
b	0.020	0.024	0.51	0.60	1, 2
b_1	0.035	0.045	0.89	1.14	1, 2
c	0.013	0.017	0.34	0.43	1, 2
D	0.126	0.134	3.21	3.40	-
E	0.242	0.248	6.15	6.29	-
e	0.100 BSC		2.54 BSC		3
e_1	0.300	-	7.62	-	3
H_1	0.038	0.042	0.97	1.06	-
L	0.266	0.296	6.76	7.51	-
L_1	0.126	0.136	3.21	3.45	-
M	0^o	10^o	0^o	10^o	-

NOTES:

1. Lead dimension (without solder).
2. Add typically 0.0006 inches (0.015mm) for solder coating.
3. Position of lead to be measured 0.100 inches (2.54mm) from bottom of dimension D.
4. Controlling dimension: Inch.
5. Revision 2 dated 10-94.

Plastic Packages



MO-093AA

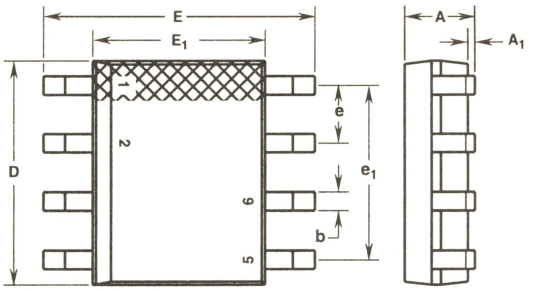
5 LEAD JEDEC MO-093AA PLASTIC PACKAGE

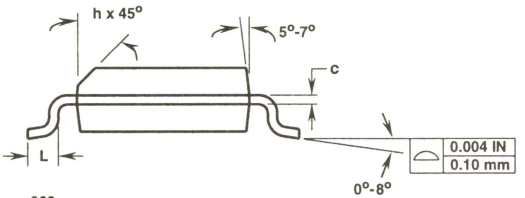
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.185	0.195	4.70	4.95	-
A_1	0.058	0.062	1.48	1.57	-
b	0.049	0.053	1.25	1.34	3, 4, 5
b_1	0.070	0.080	1.78	2.03	3, 4
c	0.018	0.022	0.46	0.55	3, 4, 5
D	0.800	0.820	20.32	20.82	-
E	0.615	0.625	15.63	15.87	2
e	0.110 TYP		2.80 TYP		7
e_1	0.438 BSC		11.12 BSC		7
H_1	-	0.330	-	8.38	-
J_1	0.115	0.125	2.93	3.17	8
L	0.575	0.600	14.61	15.24	-
L_1	-	0.130	-	3.30	3
ØP	0.159	0.163	4.04	4.14	-
Q	0.176	0.186	4.48	4.72	2

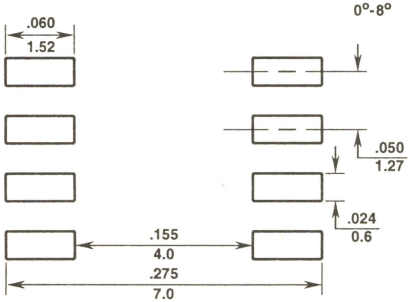
NOTES:

1. These dimensions are within allowable dimensions of Rev. A of JEDEC MO-093AA outline dated 2-90.
2. Tab outline optional within boundaries of dimensions E and Q.
3. Lead dimension and finish uncontrolled in L_1.
4. Lead dimension (without solder).
5. Add typically 0.002 inches (0.05mm) for solder coating.
6. Maximum radius of 0.050 inches (1.27mm) on all body edges and corners.
7. Position of lead to be measured 0.250 inches (6.35mm) from bottom of dimension D.
8. Position of lead to be measured 0.100 inches (2.54mm) from bottom of dimension D.
9. Controlling dimension: Inch.
10. Revision 1 dated 1-93.

Plastic Packages







MINIMUM RECOMMENDED FOOTPRINT FOR SURFACE-MOUNTED APPLICATIONS

MS-012AA

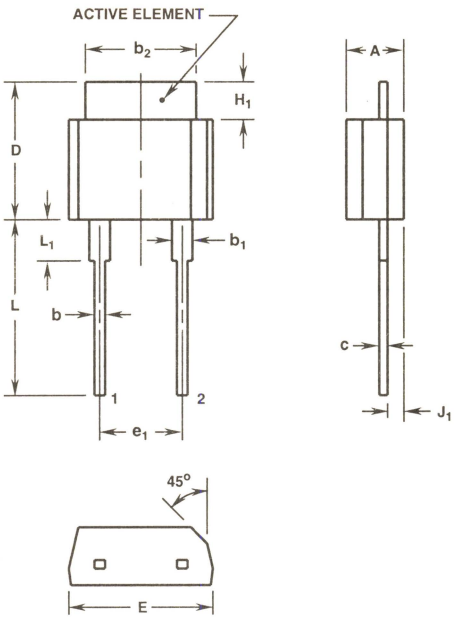
8 LEAD JEDEC MS-012AA S.O. PLASTIC PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.0532	0.0688	1.35	1.75	-
A_1	0.004	0.0098	0.10	0.25	-
b	0.013	0.020	0.33	0.51	1, 2
c	0.0075	0.009	0.19	0.22	1, 2
D	0.189	0.1968	4.80	5.00	3
E	0.2284	0.244	5.80	6.20	-
E_1	0.1497	0.1574	3.80	4.00	4
e	0.050 TYP		1.27 TYP		-
e_1	0.150 BSC		3.81 BSC		-
H	0.0099	0.0196	0.25	0.50	6
L	0.016	0.050	0.40	1.27	5

NOTES:

1. These dimensions are within allowable dimensions of Rev. C of JEDEC MS-012AA outline dated 5-90.
2. Lead dimension (without solder).
3. Add typically 0.0006 inches (0.015mm) for solder coating.
4. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusions or gate burrs shall not exceed 0.006 inches (.15mm) per side.
5. Dimension "E_1" does not include inter-lead flash or protrusions. Inter-lead flash and protrusions shall not exceed 0.010 inches (.25mm) per side.
6. "L" is the length of terminal for soldering.
7. The chamfer on the body is optional. If it is not present, a visual index feature must be located within the crosshatched area.
8. Controlling dimension: Inch.
9. Revision 2 dated 10-28-94.

Plastic Packages



TO-202 MODIFIED

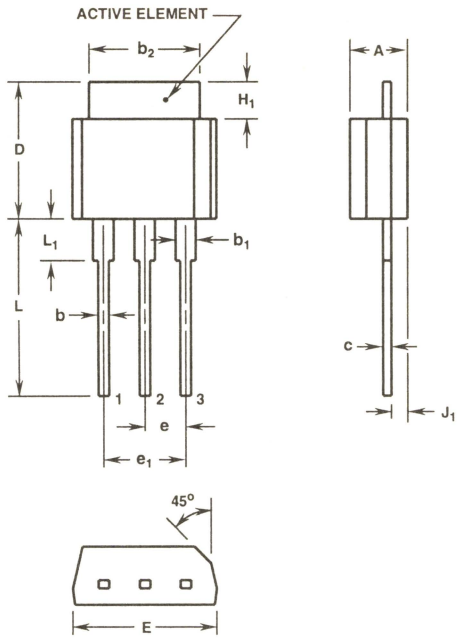
2 LEAD JEDEC STYLE TO-202 SHORT TAB PLASTIC PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.130	0.150	3.31	3.81	-
b	0.024	0.028	0.61	0.71	2, 3
b_1	0.045	0.055	1.15	1.39	1, 2, 3
b_2	0.270	0.280	6.86	7.11	-
c	0.018	0.022	0.46	0.55	1, 2, 3
D	0.320	0.340	8.13	8.63	-
E	0.340	0.360	8.64	9.14	-
e_1	0.200 BSC		5.08 BSC		4
H_1	0.080	0.100	2.04	2.54	-
J_1	0.039	0.049	1.00	1.24	5
L	0.410	0.440	10.42	11.17	-
L_1	0.080	0.100	2.04	2.54	1

NOTES:

1. Lead dimension and finish uncontrolled in L_1.
2. Lead dimension (without solder).
3. Add typically 0.002 inches (0.05mm) for solder coating.
4. Position of lead to be measured 0.250 inches (6.35mm) from bottom of dimension D.
5. Position of lead to be measured 0.100 inches (2.54mm) from bottom of dimension D.
6. Controlling dimension: Inch.
7. Revision 3 dated 10-94.

Plastic Packages



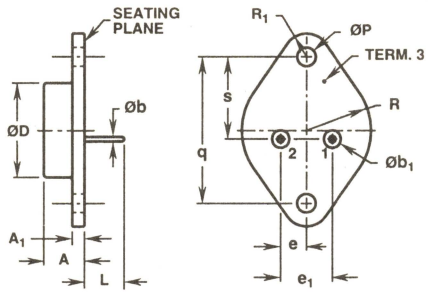
TO-202 MODIFIED
3 LEAD JEDEC STYLE TO-202 SHORT TAB PLASTIC PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.130	0.150	3.31	3.81	-
b	0.024	0.028	0.61	0.71	2, 3
b_1	0.045	0.055	1.15	1.39	1, 2, 3
b_2	0.270	0.280	6.86	7.11	-
c	0.018	0.022	0.46	0.55	1, 2, 3
D	0.320	0.340	8.13	8.63	-
E	0.340	0.360	8.64	9.14	-
e	0.100 TYP		2.54 TYP		4
e_1	0.200 BSC		5.08 BSC		4
H_1	0.080	0.100	2.04	2.54	-
J_1	0.039	0.049	1.00	1.24	5
L	0.410	0.440	10.42	11.17	-
L_1	0.080	0.100	2.04	2.54	1

NOTES:

1. Lead dimension and finish uncontrolled in L_1.
2. Lead dimension (without solder).
3. Add typically 0.002 inches (0.05mm) for solder coating.
4. Position of lead to be measured 0.250 inches (6.35mm) from bottom of dimension D.
5. Position of lead to be measured 0.100 inches (2.54mm) from bottom of dimension D.
6. Controlling dimension: Inch.
7. Revision 3 dated 10-94.

Hermetic Steel Packages



TO-204AA

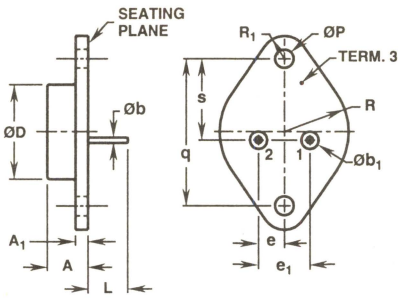
JEDEC TO-204AA HERMETIC STEEL PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.310	0.330	7.88	8.38	-
A_1	0.060	0.065	1.53	1.65	-
Øb	0.038	0.042	0.97	1.06	2, 3
$Øb_1$	0.138	0.145	3.51	3.68	-
ØD	-	0.800	-	20.32	-
e	0.215 TYP		5.46 TYP		4
e_1	0.430 BSC		10.92 BSC		4
L	0.430	-	10.93	-	-
ØP	0.155	0.160	3.94	4.06	-
q	1.187 BSC		30.15 BSC		-
R	0.495	0.525	12.58	13.33	-
R_1	0.131	0.185	3.33	4.69	-
s	0.655	0.675	16.64	17.14	-

NOTES:

1. These dimensions are within allowable dimensions of Rev. C of JEDEC TO-204AA outline dated 11-82.
2. Lead dimension (without solder).
3. Add typically 0.002 inches (0.05mm) for solder coating.
4. Position of lead to be measured 0.250 inches (6.35mm) from bottom of seating plane.
5. Controlling dimension: Inch.
6. Revision 2 dated 6-93.

Hermetic Steel Packages



TO-204AE

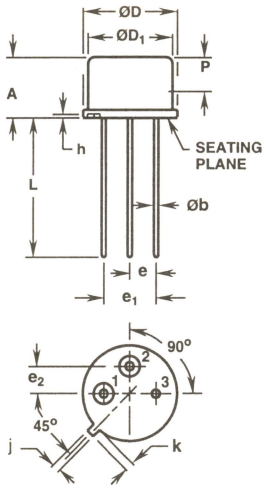
JEDEC TO-204AE HERMETIC STEEL PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.310	0.330	7.88	8.38	-
A_1	0.060	0.065	1.53	1.65	-
Øb	0.057	0.063	1.45	1.60	2, 3
$Øb_1$	0.138	0.145	3.51	3.68	-
ØD	-	0.800	-	20.32	-
e	0.215 TYP		5.46 TYP		4
e_1	0.430 BSC		10.92 BSC		4
L	0.440	0.480	11.18	12.19	-
ØP	0.155	0.160	3.94	4.06	-
q	1.187 BSC		30.15 BSC		-
R	0.495	0.525	12.58	13.33	-
R_1	0.131	0.185	3.33	4.69	-
s	0.655	0.675	16.64	17.14	-

NOTES:

1. These dimensions are within allowable dimensions of Rev. B of JEDEC TO-204AE outline dated 11-82.
2. Lead dimension (without solder).
3. Add typically 0.002 inches (0.05mm) for solder coating.
4. Position of lead to be measured 0.250 inches (6.35mm) from bottom of seating plane.
5. Controlling dimension: Inch.
6. Revision 2 dated 6-93.

Metal Can Packages



TO-205AB

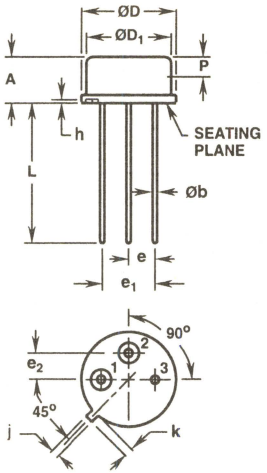
3 LEAD JEDEC TO-205AB HERMETIC METAL CAN PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.240	0.260	6.10	6.60	-
Øb	0.016	0.021	0.41	0.53	2, 3
ØD	0.350	0.370	8.89	9.39	-
$ØD_1$	0.315	0.335	8.01	8.50	-
e	0.095	0.105	2.42	2.66	4
e_1	0.190	0.210	4.83	5.33	4
e_2	0.095	0.105	2.42	2.66	4
h	0.010	0.020	0.26	0.50	-
j	0.028	0.034	0.72	0.86	-
k	0.029	0.045	0.74	1.14	-
L	0.500	0.560	12.70	14.22	3
P	0.100	-	2.54	-	5

NOTES:

1. These dimensions are within allowable dimensions of Rev. E of JEDEC TO-205AB outline dated 11-82.
2. Lead dimension (without solder).
3. Solder coating may vary along lead length, add typically 0.002 inches (0.05mm) for solder coating.
4. Position of lead to be measured 0.100 inches (2.54mm) from bottom of seating plane.
5. This zone controlled for automatic handling. The variation in actual diameter within this zone shall not exceed 0.010 inches (0.254mm).
6. Lead no. 3 butt welded to stem base.
7. Controlling dimension: Inch.
8. Revision 2 dated 6-94.

Metal Can Packages



TO-205AF

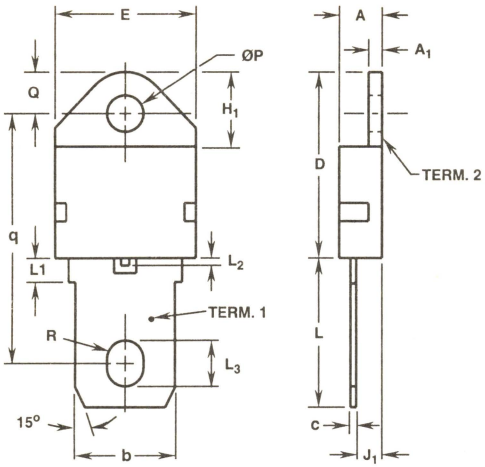
3 LEAD JEDEC TO-205AF HERMETIC METAL CAN PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.160	0.180	4.07	4.57	-
Øb	0.016	0.021	0.41	0.53	2, 3
ØD	0.350	0.370	8.89	9.39	-
$ØD_1$	0.315	0.335	8.01	8.50	-
e	0.095	0.105	2.42	2.66	4
e_1	0.190	0.210	4.83	5.33	4
e_2	0.095	0.105	2.42	2.66	4
h	0.010	0.020	0.26	0.50	-
j	0.028	0.034	0.72	0.86	-
k	0.029	0.045	0.74	1.14	-
L	0.500	0.560	12.70	14.22	3
P	0.075	-	1.91	-	5

NOTES:

1. These dimensions are within allowable dimensions of Rev. E of JEDEC TO-205AF outline dated 11-82.
2. Lead dimension (without solder).
3. Solder coating may vary along lead length, add typically 0.002 inches (0.05mm) for solder coating.
4. Position of lead to be measured 0.100 inches (2.54mm) from bottom of seating plane.
5. This zone controlled for automatic handling. The variation in actual diameter within this zone shall not exceed 0.010 inches (0.254mm).
6. Lead no. 3 butt welded to stem base.
7. Controlling dimension: Inch.
8. Revision 3 dated 6-94.

Plastic Packages



TO-218

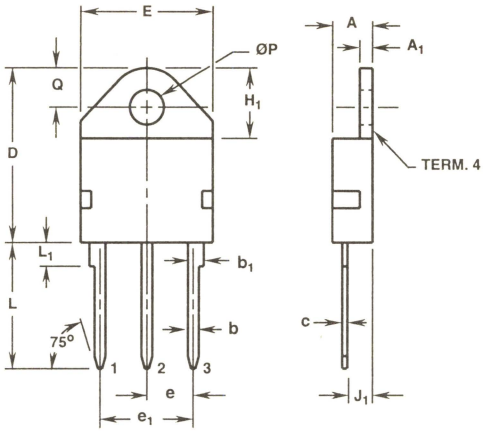
SINGLE LEAD JEDEC STYLE TO-218 PLASTIC PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.185	0.195	4.70	4.95	-
A_1	0.058	0.062	1.48	1.57	-
b	0.433	0.443	11.00	11.25	-
c	0.018	0.022	0.46	0.55	-
D	0.800	0.820	20.32	20.82	-
E	0.615	0.625	15.63	15.87	2
H_1	-	0.330	-	8.38	-
J_1	0.115	0.125	2.93	3.17	4
L	0.635	0.655	16.13	16.63	-
L_1	-	0.130	-	3.30	-
L_2	-	0.034	-	0.86	-
L_3	0.195	0.205	4.96	5.20	-
ØP	0.159	0.163	4.04	4.14	-
Q	0.176	0.186	4.48	4.72	2
q	1.080	1.088	27.44	27.63	-
R	0.078	0.082	1.99	2.08	-

NOTES:

1. No current JEDEC outline for this package.
2. Tab outline optional within boundaries of dimensions E and Q.
3. Maximum radius of 0.050 inches (1.27mm) on all body edges and corners.
4. Position of lead to be measured 0.100 inches (2.54mm) from bottom of dimension D.
5. Controlling dimension: Inch.
6. Revision 1 dated 1-93.

Plastic Packages



TO-218AC

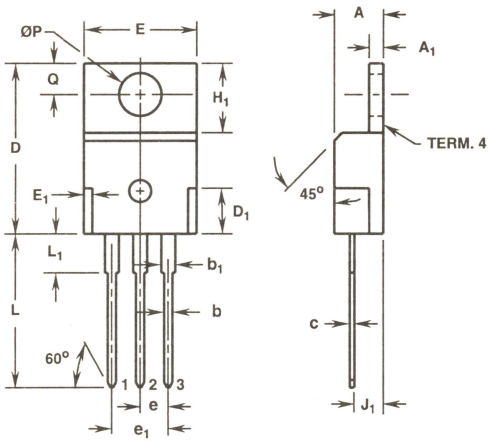
3 LEAD JEDEC TO-218AC PLASTIC PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.185	0.195	4.70	4.95	-
A_1	0.058	0.062	1.48	1.57	-
b	0.049	0.053	1.25	1.34	3, 4, 5
b_1	0.070	0.080	1.78	2.03	3, 4
c	0.018	0.022	0.46	0.55	3, 4, 5
D	0.800	0.820	20.32	20.82	-
E	0.615	0.625	15.63	15.87	2
e	0.219 TYP		5.56 TYP		7
e_1	0.438 BSC		11.12 BSC		7
H_1	-	0.330	-	8.38	-
J_1	0.115	0.125	2.93	3.17	8
L	0.575	0.600	14.61	15.24	-
L_1	-	0.130	-	3.30	3
ØP	0.159	0.163	4.04	4.14	-
Q	0.176	0.186	4.48	4.72	2

NOTES:

1. These dimensions are within allowable dimensions of Rev. E of JEDEC TO-218AC outline dated 6-86.
2. Tab outline optional within boundaries of dimensions E and Q.
3. Lead dimension and finish uncontrolled in L_1.
4. Lead dimension (without solder).
5. Add typically 0.002 inches (0.05mm) for solder coating.
6. Maximum radius of 0.050 inches (1.27mm) on all body edges and corners.
7. Position of lead to be measured 0.250 inches (6.35mm) from bottom of dimension D.
8. Position of lead to be measured 0.100 inches (2.54mm) from bottom of dimension D.
9. Controlling dimension: Inch.
10. Revision 1 dated 1-93.

Plastic Packages



TO-220AB

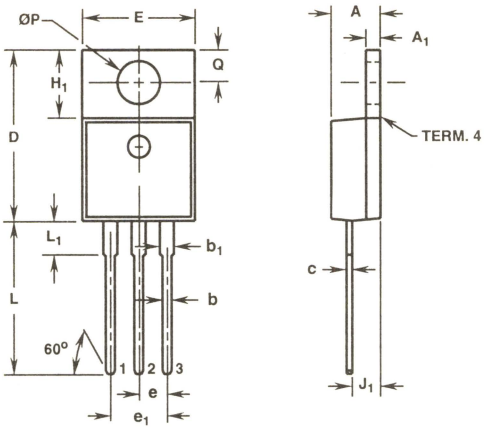
3 LEAD JEDEC TO-220AB PLASTIC PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.170	0.180	4.32	4.57	-
A_1	0.048	0.052	1.22	1.32	-
b	0.030	0.034	0.77	0.86	3, 4
b_1	0.045	0.055	1.15	1.39	2, 3
c	0.014	0.019	0.36	0.48	2, 3, 4
D	0.590	0.610	14.99	15.49	-
D_1	-	0.160	-	4.06	-
E	0.395	0.410	10.04	10.41	-
E_1	-	0.030	-	0.76	-
e	0.100 TYP		2.54 TYP		5
e_1	0.200 BSC		5.08 BSC		5
H_1	0.235	0.255	5.97	6.47	-
J_1	0.100	0.110	2.54	2.79	6
L	0.530	0.550	13.47	13.97	-
L_1	0.130	0.150	3.31	3.81	2
ØP	0.149	0.153	3.79	3.88	-
Q	0.102	0.112	2.60	2.84	-

NOTES:

1. These dimensions are within allowable dimensions of Rev. J of JEDEC TO-220AB outline dated 3-24-87.
2. Lead dimension and finish uncontrolled in L_1.
3. Lead dimension (without solder).
4. Add typically 0.002 inches (0.05mm) for solder coating.
5. Position of lead to be measured 0.250 inches (6.35mm) from bottom of dimension D.
6. Position of lead to be measured 0.100 inches (2.54mm) from bottom of dimension D.
7. Controlling dimension: Inch.
8. Revision 1 dated 1-93.

Plastic Packages



TO-220AB (ALTERNATE VERSION)

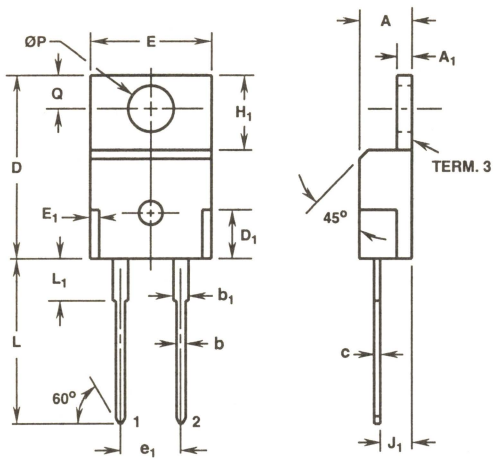
3 LEAD JEDEC TO-220AB PLASTIC PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.170	0.180	4.32	4.57	-
A_1	0.048	0.052	1.22	1.32	-
b	0.030	0.034	0.77	0.86	2, 3
b_1	0.045	0.055	1.15	1.39	2
c	0.018	0.022	0.46	0.55	2, 3
D	0.590	0.610	14.99	15.49	-
E	0.395	0.405	10.04	10.28	-
e	0.100 TYP		2.54 TYP		4
e_1	0.200 BSC		5.08 BSC		4
H_1	0.235	0.255	5.97	6.47	-
J_1	0.095	0.105	2.42	2.66	5
L	0.530	0.550	13.47	13.97	-
L_1	0.110	0.130	2.80	3.30	-
ØP	0.149	0.153	3.79	3.88	-
Q	0.105	0.115	2.66	2.92	-

NOTES:

1. These dimensions are within allowable dimensions of Rev. J of JEDEC TO-220AB outline dated 3-24-87.
2. Lead dimension (without solder).
3. Add typically 0.0006 inches (0.015mm) for solder plating.
4. Position of lead to be measured 0.250 inches (6.35mm) from bottom of dimension D.
5. Position of lead to be measured 0.100 inches (2.54mm) from bottom of dimension D.
6. Controlling dimension: Inch.
7. Revision 1 dated 3-95.

Plastic Packages



TO-220AC

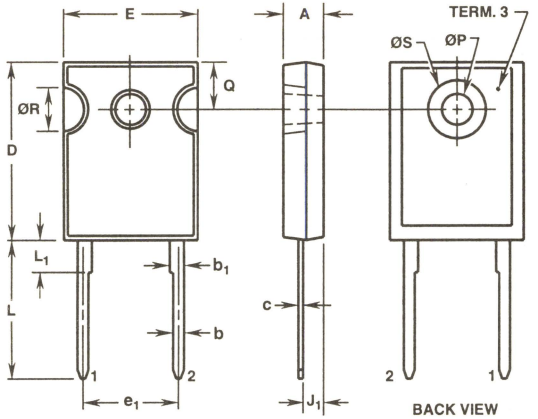
2 LEAD JEDEC TO-220AC PLASTIC PACKAGE (FOR RECTIFIERS ONLY)

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.170	0.180	4.32	4.57	-
A_1	0.048	0.052	1.22	1.32	-
b	0.030	0.034	0.77	0.86	3, 4
b_1	0.045	0.055	1.15	1.39	2, 3
c	0.014	0.019	0.36	0.48	2, 3, 4
D	0.590	0.610	14.99	15.49	-
D_1	-	0.160	-	4.06	-
E	0.395	0.410	10.04	10.41	-
E_1	-	0.030	-	0.76	-
e_1	0.200 BSC		5.08 BSC		5
H_1	0.235	0.255	5.97	6.47	-
J_1	0.100	0.110	2.54	2.79	6
L	0.530	0.550	13.47	13.97	-
L_1	0.130	0.150	3.31	3.81	2
ØP	0.149	0.153	3.79	3.88	-
Q	0.102	0.112	2.60	2.84	-

NOTES:

1. These dimensions are within allowable dimensions of Rev. J of JEDEC TO-220AC outline dated 3-24-87.
2. Lead dimension and finish uncontrolled in L_1.
3. Lead dimension (without solder).
4. Add typically 0.002 inches (0.05mm) for solder coating.
5. Position of lead to be measured 0.250 inches (6.35mm) from bottom of dimension D.
6. Position of lead to be measured 0.100 inches (2.54mm) from bottom of dimension D.
7. Controlling dimension: Inch.
8. Revision 2 dated 12-93.

Plastic Packages



TO-247

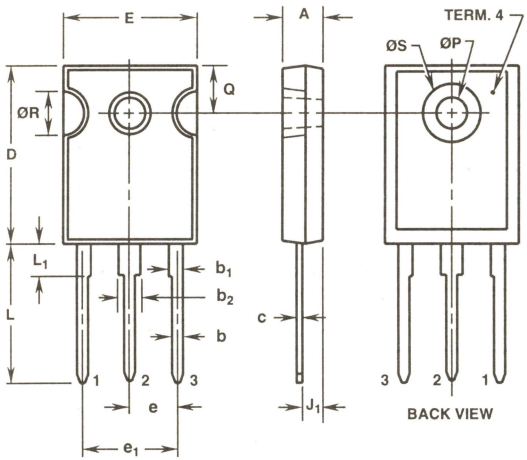
2 LEAD JEDEC STYLE TO-247 PLASTIC PACKAGE (FOR RECTIFIERS ONLY)

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.180	0.190	4.58	4.82	-
b	0.046	0.051	1.17	1.29	2, 3
b_1	0.060	0.070	1.53	1.77	1, 2
c	0.020	0.026	0.51	0.66	1, 2, 3
D	0.800	0.820	20.32	20.82	-
E	0.605	0.625	15.37	15.87	-
e_1	0.438 BSC		11.12 BSC		4
J_1	0.090	0.105	2.29	2.66	5
L	0.620	0.640	15.75	16.25	-
L_1	0.145	0.155	3.69	3.93	1
ØP	0.138	0.144	3.51	3.65	-
Q	0.210	0.220	5.34	5.58	-
ØR	0.195	0.205	4.96	5.20	-
ØS	0.260	0.270	6.61	6.85	-

NOTES:

1. Lead dimension and finish uncontrolled in L_1.
2. Lead dimension (without solder).
3. Add typically 0.002 inches (0.05mm) for solder coating.
4. Position of lead to be measured 0.250 inches (6.35mm) from bottom of dimension D.
5. Position of lead to be measured 0.100 inches (2.54mm) from bottom of dimension D.
6. Controlling dimension: Inch.
7. Revision 2 dated 12-93.

Plastic Packages



TO-247

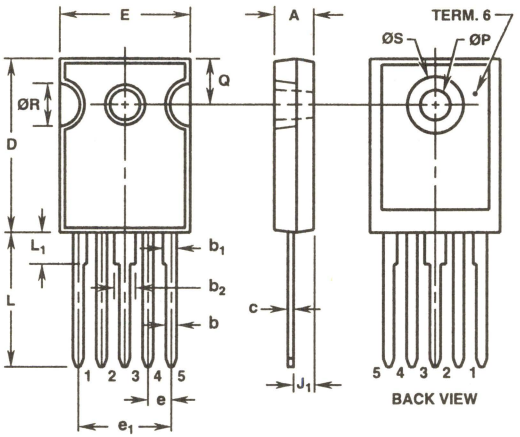
3 LEAD JEDEC STYLE TO-247 PLASTIC PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.180	0.190	4.58	4.82	-
b	0.046	0.051	1.17	1.29	2, 3
b_1	0.060	0.070	1.53	1.77	1, 2
b_2	0.095	0.105	2.42	2.66	1, 2
c	0.020	0.026	0.51	0.66	1, 2, 3
D	0.800	0.820	20.32	20.82	-
E	0.605	0.625	15.37	15.87	-
e	0.219 TYP		5.56 TYP		4
e_1	0.438 BSC		11.12 BSC		4
J_1	0.090	0.105	2.29	2.66	5
L	0.620	0.640	15.75	16.25	-
L_1	0.145	0.155	3.69	3.93	1
ØP	0.138	0.144	3.51	3.65	-
Q	0.210	0.220	5.34	5.58	-
ØR	0.195	0.205	4.96	5.20	-
ØS	0.260	0.270	6.61	6.85	-

NOTES:

1. Lead dimension and finish uncontrolled in L_1.
2. Lead dimension (without solder).
3. Add typically 0.002 inches (0.05mm) for solder coating.
4. Position of lead to be measured 0.250 inches (6.35mm) from bottom of dimension D.
5. Position of lead to be measured 0.100 inches (2.54mm) from bottom of dimension D.
6. Controlling dimension: Inch.
7. Revision 1 dated 1-93.

Plastic Packages



TO-247

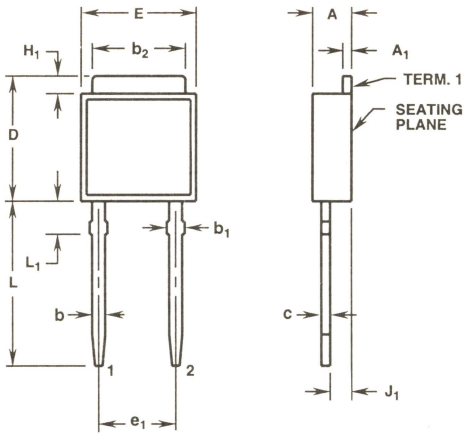
5 LEAD JEDEC STYLE TO-247 PLASTIC PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.180	0.190	4.58	4.82	-
b	0.046	0.051	1.17	1.29	2, 3
b_1	0.060	0.070	1.53	1.77	1, 2
b_2	0.095	0.105	2.42	2.66	1, 2
c	0.020	0.026	0.51	0.66	1, 2, 3
D	0.800	0.820	20.32	20.82	-
E	0.605	0.625	15.37	15.87	-
e	0.110 TYP		2.79 TYP		4
e_1	0.438 BSC		11.12 BSC		4
J_1	0.090	0.105	2.29	2.66	5
L	0.620	0.640	15.75	16.25	-
L_1	0.145	0.155	3.69	3.93	1
ØP	0.138	0.144	3.51	3.65	-
Q	0.210	0.220	5.34	5.58	-
ØR	0.195	0.205	4.96	5.20	-
ØS	0.260	0.270	6.61	6.85	-

NOTES:

1. Lead dimension and finish uncontrolled in L_1.
2. Lead dimension (without solder).
3. Add typically 0.002 inches (0.05mm) for solder coating.
4. Position of lead to be measured 0.250 inches (6.35mm) from bottom of dimension D.
5. Position of lead to be measured 0.100 inches (2.54mm) from bottom of dimension D.
6. Controlling dimension: Inch.
7. Revision 1 dated 1-93.

Plastic Packages



TO-251

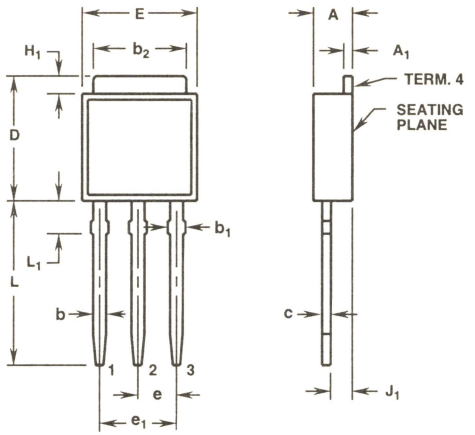
2 LEAD JEDEC STYLE TO-251 PLASTIC PACKAGE (FOR RECTIFIERS ONLY)

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.086	0.094	2.19	2.38	-
A_1	0.018	0.022	0.46	0.55	3, 4
b	0.028	0.032	0.72	0.81	3, 4
b_1	0.033	0.040	0.84	1.01	3
b_2	0.205	0.215	5.21	5.46	3, 4
c	0.018	0.022	0.46	0.55	3, 4
D	0.270	0.290	6.86	7.36	-
E	0.250	0.265	6.35	6.73	-
e_1	0.180 BSC		4.57 BSC		5
H_1	0.035	0.045	0.89	1.14	-
J_1	0.040	0.045	1.02	1.14	6
L	0.355	0.375	9.02	9.52	-
L_1	0.075	0.090	1.91	2.28	2

NOTES:

1. No current JEDEC outline for this package.
2. Solder finish uncontrolled.
3. Dimension (without solder).
4. Add typically 0.0006 inches (0.015mm) for solder coating.
5. Position of lead to be measured 0.250 inches (6.35mm) from bottom of dimension D.
6. Position of lead to be measured 0.100 inches (2.54mm) from bottom of dimension D.
7. Controlling dimension: Inch.
8. Revision 1 dated 6-93.

Plastic Packages



TO-251AA

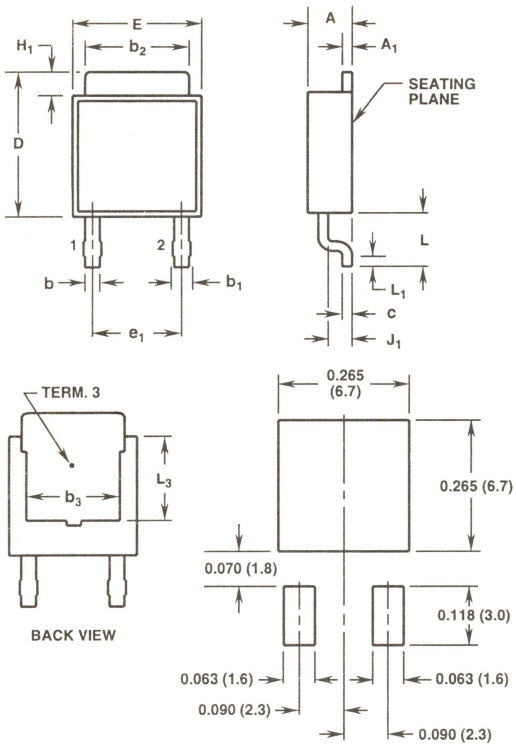
3 LEAD JEDEC TO-251AA PLASTIC PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.086	0.094	2.19	2.38	-
A_1	0.018	0.022	0.46	0.55	3, 4
b	0.028	0.032	0.72	0.81	3, 4
b_1	0.033	0.040	0.84	1.01	3
b_2	0.205	0.215	5.21	5.46	3, 4
c	0.018	0.022	0.46	0.55	3, 4
D	0.270	0.290	6.86	7.36	-
E	0.250	0.265	6.35	6.73	-
e	0.090 TYP		2.28 TYP		5
e_1	0.180 BSC		4.57 BSC		5
H_1	0.035	0.045	0.89	1.14	-
J_1	0.040	0.045	1.02	1.14	6
L	0.355	0.375	9.02	9.52	-
L_1	0.075	0.090	1.91	2.28	2

NOTES:

1. These dimensions are within allowable dimensions of Rev. C of JEDEC TO-251AA outline dated 9-88.
2. Solder finish uncontrolled.
3. Dimension (without solder).
4. Add typically 0.0006 inches (0.015mm) for solder coating.
5. Position of lead to be measured 0.250 inches (6.35mm) from bottom of dimension D.
6. Position of lead to be measured 0.100 inches (2.54mm) from bottom of dimension D.
7. Controlling dimension: Inch.
8. Revision 1 dated 1-93.

Plastic Packages



MINIMUM PAD SIZE RECOMMENDED FOR SURFACE-MOUNTED APPLICATIONS

TO-252

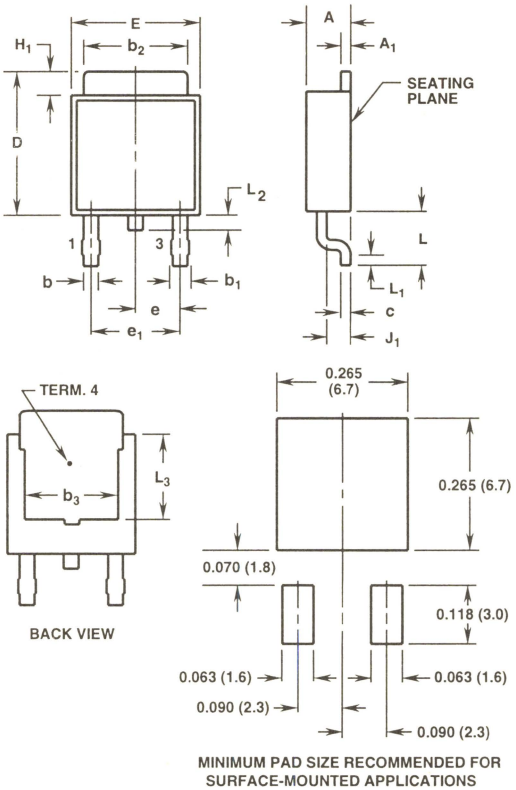
2 LEAD JEDEC STYLE TO-252 PLASTIC PACKAGE (FOR RECTIFIERS ONLY)

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.086	0.094	2.19	2.38	-
A_1	0.018	0.022	0.46	0.55	4, 5
b	0.028	0.032	0.72	0.81	4, 5
b_1	0.033	0.040	0.84	1.01	4
b_2	0.205	0.215	5.21	5.46	4, 5
b_3	0.190	-	4.83	-	2
c	0.018	0.022	0.46	0.55	4, 5
D	0.270	0.290	6.86	7.36	-
E	0.250	0.265	6.35	6.73	-
e_1	0.180 BSC		4.57 BSC		7
H_1	0.035	0.045	0.89	1.14	-
J_1	0.040	0.045	1.02	1.14	-
L	0.100	0.115	2.54	2.92	-
L_1	0.020	-	0.51	-	4, 6
L_3	0.170	-	4.32	-	2

NOTES:

1. No current JEDEC outline for this package.
2. L_3 and b_3 dimensions establish a minimum mounting surface for terminal 3.
3. Solder finish uncontrolled.
4. Dimension (without solder).
5. Add typically 0.0006 inches (0.015mm) for solder coating.
6. L_1 is the terminal length for soldering.
7. Position of lead to be measured 0.090 inches (2.28mm) from bottom of dimension D.
8. Controlling dimension: Inch.
9. Revision 2 dated 3-94.

Plastic Packages



MINIMUM PAD SIZE RECOMMENDED FOR SURFACE-MOUNTED APPLICATIONS

TO-252AA

2 LEAD JEDEC TO-252AA PLASTIC PACKAGE

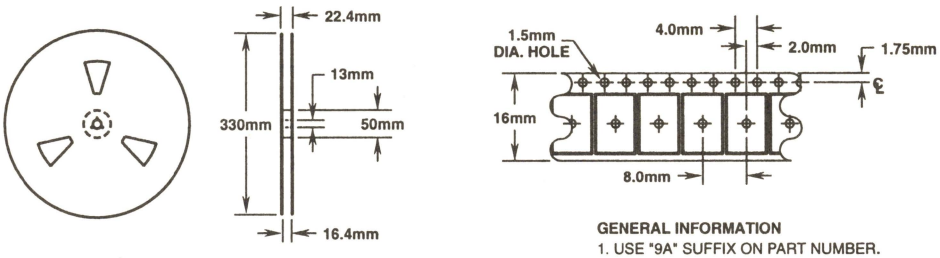
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.086	0.094	2.19	2.38	-
A_1	0.018	0.022	0.46	0.55	4, 5
b	0.028	0.032	0.72	0.81	4, 5
b_1	0.033	0.040	0.84	1.01	4
b_2	0.205	0.215	5.21	5.46	4, 5
b_3	0.190	-	4.83	-	2
c	0.018	0.022	0.46	0.55	4, 5
D	0.270	0.290	6.86	7.36	-
E	0.250	0.265	6.35	6.73	-
e	0.090 TYP		2.28 TYP		7
e_1	0.180 BSC		4.57 BSC		7
H_1	0.035	0.045	0.89	1.14	-
J_1	0.040	0.045	1.02	1.14	-
L	0.100	0.115	2.54	2.92	-
L_1	0.020	-	0.51	-	4, 6
L_2	0.025	0.040	0.64	1.01	-
L_3	0.170	-	4.32	-	2

NOTES:

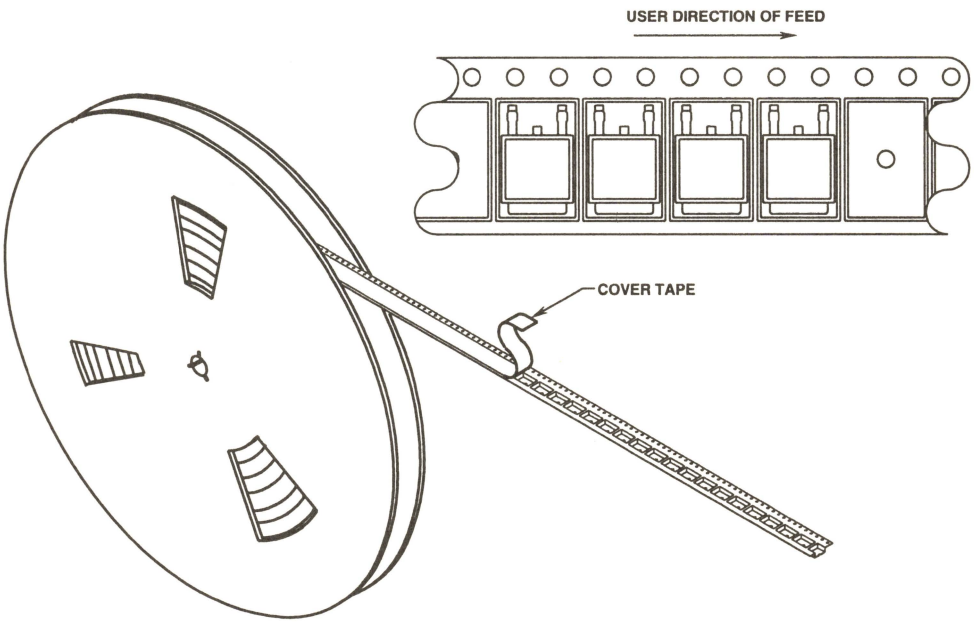
1. These dimensions are within allowable dimensions of Rev. B of JEDEC TO-252AA outline dated 9-88.
2. L_3 and b_3 dimensions establish a minimum mounting surface for terminal 4.
3. Solder finish uncontrolled.
4. Dimension (without solder).
5. Add typically 0.0006 inches (0.015mm) for solder coating.
6. L_1 is the terminal length for soldering.
7. Position of lead to be measured 0.090 inches (2.28mm) from bottom of dimension D.
8. Controlling dimension: Inch.
9. Revision 4 dated 4-94.

Plastic Packages

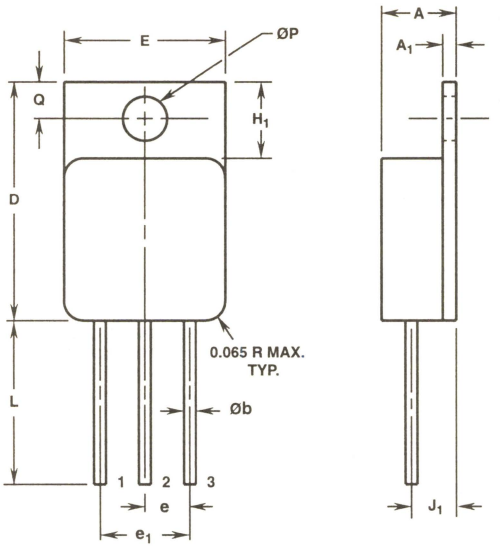
TO-252AA
16mm TAPE AND REEL



GENERAL INFORMATION
1. USE "9A" SUFFIX ON PART NUMBER.
2. 2500 PIECES PER REEL.
3. ORDER IN MULTIPLES OF FULL REELS ONLY.
4. MEETS EIA-481 REVISION "A" SPECIFICATIONS.



Hermetic Metal Packages



TO-254AA

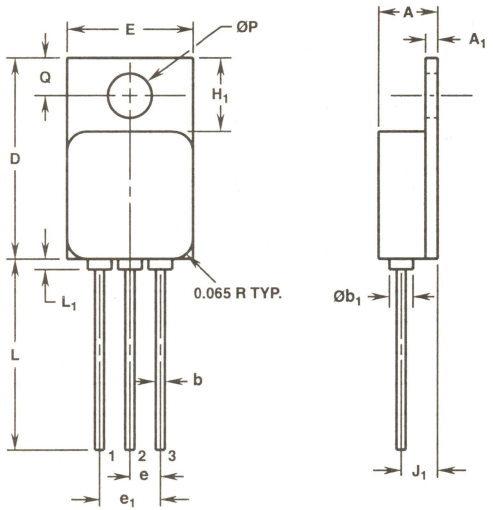
3 LEAD JEDEC TO-254AA HERMETIC METAL PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.249	0.260	6.33	6.60	-
A_1	0.040	0.050	1.02	1.27	-
Øb	0.035	0.045	0.89	1.14	2, 3
D	0.790	0.800	20.07	20.32	-
E	0.535	0.545	13.59	13.84	-
e	0.150 TYP		3.81 TYP		4
e_1	0.300 BSC		7.62 BSC		4
H_1	0.245	0.265	6.23	6.73	-
J_1	0.140	0.160	3.56	4.06	4
L	0.520	0.560	13.21	14.22	-
ØP	0.139	0.149	3.54	3.78	-
Q	0.110	0.130	2.80	3.30	-

NOTES:

1. These dimensions are within allowable dimensions of Rev. A of JEDEC outline TO-254AA dated 11-86.
2. Add typically 0.002 inches (0.05mm) for solder coating.
3. Lead dimension (without solder).
4. Position of lead to be measured 0.250 inches (6.35mm) from bottom of dimension D.
5. Die to base BeO isolated, terminals to case ceramic isolated.
6. Controlling dimension: Inch.
7. Revision 1 dated 1-93.

Hermetic Metal Packages



TO-257AA

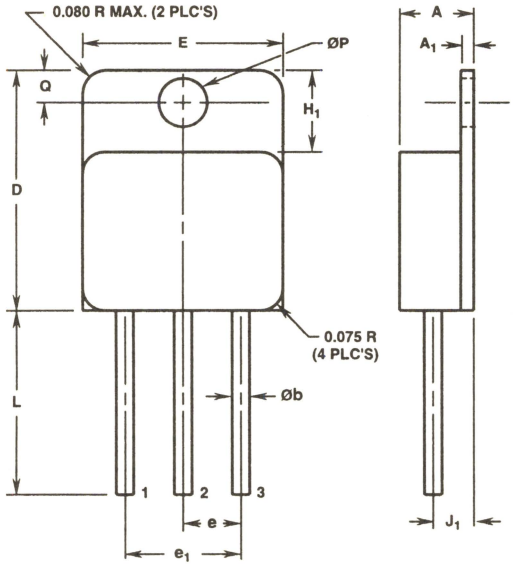
3 LEAD JEDEC TO-257AA HERMETIC METAL PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.190	0.200	4.83	5.08	-
A_1	0.035	0.045	0.89	1.14	-
Øb	0.025	0.035	0.64	0.88	2, 3
$Øb_1$	0.060	0.090	1.53	2.28	-
D	0.645	0.665	16.39	16.89	-
E	0.410	0.420	10.42	10.66	-
e	0.100 TYP		2.54 TYP		4
e_1	0.200 BSC		5.08 BSC		4
H_1	0.230	0.250	5.85	6.35	-
J_1	0.110	0.130	2.80	3.30	4
L	0.600	0.650	15.24	16.51	-
L_1	-	0.035	-	0.88	-
ØP	0.140	0.150	3.56	3.81	-
Q	0.113	0.133	2.88	3.37	-

NOTES:

1. These dimensions are within allowable dimensions of Rev. B of JEDEC TO-257AA dated 9-88.
2. Add typically 0.002 inches (0.05mm) for solder coating.
3. Lead dimension (without solder).
4. Position of lead to be measured 0.150 inches (3.81mm) from bottom of dimension D.
5. Die to base BeO isolated, terminals to case ceramic isolated.
6. Controlling dimension: Inch.
7. Revision 1 dated 1-93.

Hermetic Metal Packages



TO-258AA

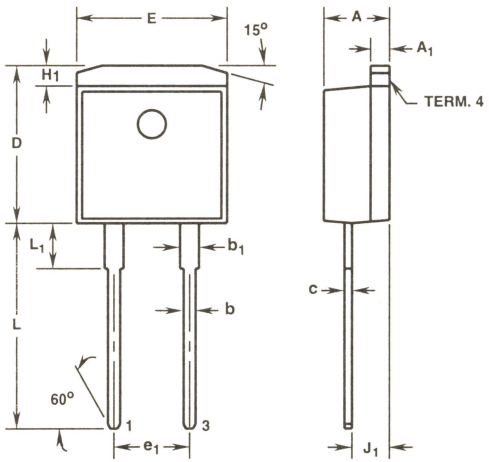
3 LEAD JEDEC TO-258AA HERMETIC METAL PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.250	0.270	6.35	6.85	-
A_1	0.035	0.045	0.89	1.14	-
Øb	0.055	0.065	1.40	1.65	2, 3
D	0.815	0.830	20.71	21.08	-
E	0.685	0.695	17.40	17.65	-
e	0.200 TYP		5.08 TYP		4
e_1	0.400 BSC		10.16 BSC		4
H_1	0.270	0.290	6.86	7.36	-
J_1	0.130	0.150	3.31	3.81	4
L	0.600	0.650	15.24	16.51	-
ØP	0.155	0.165	3.94	4.19	-
Q	0.115	0.125	2.93	3.17	-

NOTES:

1. These dimensions are within allowable dimensions of Rev. A of JEDEC TO-258AA outline dated 2-88.
2. Add typically 0.002 inches (0.05mm) for solder coating.
3. Lead dimension (without solder).
4. Position of lead to be measured 0.250 inches (6.35mm) from bottom of dimension D.
5. Die to base BeO isolated, terminals to case ceramic isolated.
6. Controlling dimension: Inch.
7. Revision 1 dated 1-93.

Plastic Packages



TO-262

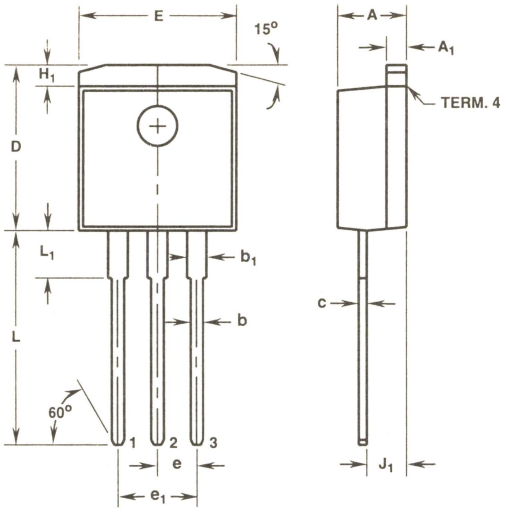
2 LEAD JEDEC STYLE TO-262 PLASTIC PACKAGE (FOR RECTIFIERS ONLY)

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.170	0.180	4.32	4.57	-
A_1	0.048	0.052	1.22	1.32	-
b	0.030	0.034	0.77	0.86	3, 4
b_1	0.045	0.055	1.15	1.39	2, 3
c	0.018	0.022	0.46	0.55	2, 3, 4
D	0.405	0.425	10.29	10.79	-
E	0.395	0.405	10.04	10.28	-
e_1	0.200 BSC		5.08 BSC		5
H_1	0.045	0.055	1.15	1.39	-
J_1	0.095	0.105	2.42	2.66	6
L	0.530	0.550	13.47	13.97	-
L_1	0.110	0.130	2.80	3.30	2

NOTES:

1. No current JEDEC outline for this package.
2. Lead dimension and finish uncontrolled in L_1.
3. Lead dimension (without solder).
4. Add typically 0.0006 inches (0.015mm) for solder plating.
5. Position of lead to be measured 0.250 inches (6.35mm) from bottom of dimension D.
6. Position of lead to be measured 0.100 inches (2.54mm) from bottom of dimension D.
7. Controlling dimension: Inch.
8. Revision 1 dated 4-95.

Plastic Packages



TO-262AA

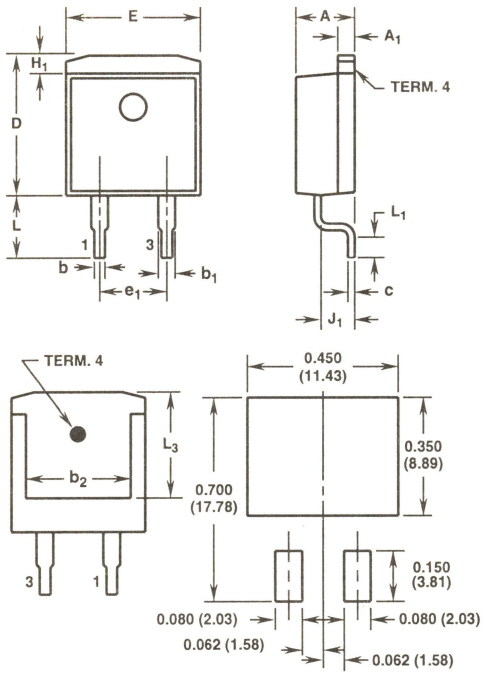
3 LEAD JEDEC TO-262AA PLASTIC PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.170	0.180	4.32	4.57	-
A_1	0.048	0.052	1.22	1.32	-
b	0.030	0.034	0.77	0.86	3, 4
b_1	0.045	0.055	1.15	1.39	2, 3
c	0.018	0.022	0.46	0.55	2, 3, 4
D	0.405	0.425	10.29	10.79	-
E	0.395	0.405	10.04	10.28	-
e	0.100 TYP		2.54 TYP		5
e_1	0.200 BSC		5.08 BSC		5
H_1	0.045	0.055	1.15	1.39	-
J_1	0.095	0.105	2.42	2.66	6
L	0.530	0.550	13.47	13.97	-
L_1	0.110	0.130	2.80	3.30	2

NOTES:

1. These dimensions are within allowable dimensions of Rev. A of JEDEC TO-262AA outline dated 6-90.
2. Lead dimension and finish uncontrolled in L_1.
3. Lead dimension (without solder).
4. Add typically 0.0006 inches (0.015mm) for solder plating.
5. Position of lead to be measured 0.250 inches (6.35mm) from bottom of dimension D.
6. Position of lead to be measured 0.100 inches (2.54mm) from bottom of dimension D.
7. Controlling dimension: Inch.
8. Revision 3 dated 2-95.

Plastic Packages



MINIMUM PAD SIZE RECOMMENDED FOR SURFACE-MOUNTED APPLICATIONS

TO-263

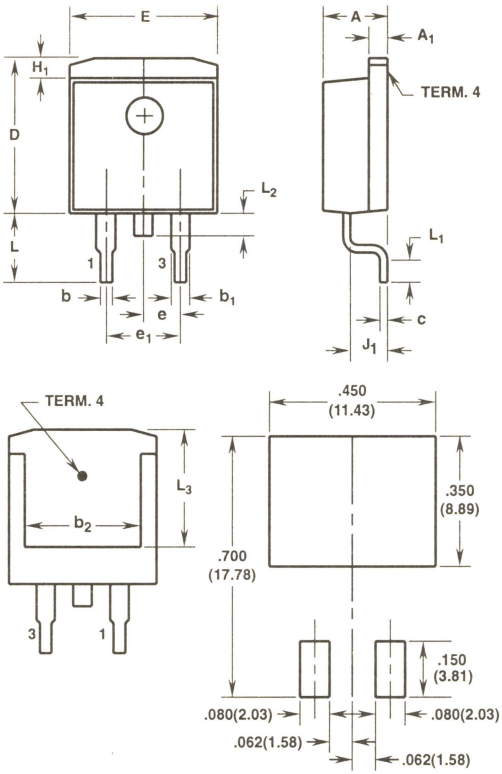
2 LEAD JEDEC STYLE TO-263 PLASTIC PACKAGE (FOR RECTIFIERS ONLY)

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.170	0.180	4.32	4.57	-
A_1	0.048	0.052	1.22	1.32	4, 5
b	0.030	0.034	0.77	0.86	4, 5
b_1	0.045	0.055	1.15	1.39	4
b_2	0.310	-	7.88	-	2
c	0.018	0.022	0.46	0.55	4, 5
D	0.405	0.425	10.29	10.79	-
E	0.395	0.405	10.04	10.28	-
e_1	0.200 BSC		5.08 BSC		7
H_1	0.045	0.055	1.15	1.39	-
J_1	0.095	0.105	2.42	2.66	-
L	0.175	0.195	4.45	4.95	-
L_1	0.090	0.110	2.29	2.79	4, 6
L_3	0.315	-	8.01	-	2

NOTES:

1. No current JEDEC outline for this package.
2. L_3 and b_2 dimensions established a minimum mounting surface for terminal 4.
3. Solder finish uncontrolled.
4. Dimension (without solder).
5. Add typically 0.0006 inches (0.015mm) for solder plating.
6. L_1 is the terminal length for soldering.
7. Position of lead to be measured 0.120 inches (3.05mm) from bottom of dimension D.
8. Controlling dimension: Inch.
9. Revision 1 dated 4-95.

Plastic Packages



MINIMUM PAD SIZE RECOMMENDED FOR SURFACE-MOUNTED APPLICATIONS

TO-263AB

2 LEAD JEDEC TO-263AB PLASTIC PACKAGE

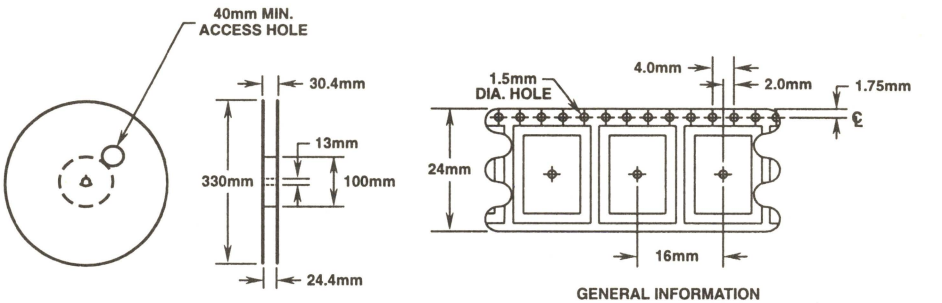
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.170	0.180	4.32	4.57	-
A_1	0.048	0.052	1.22	1.32	4, 5
b	0.030	0.034	0.77	0.86	4, 5
b_1	0.045	0.055	1.15	1.39	4
b_2	0.310	-	7.88	-	2
c	0.018	0.022	0.46	0.55	4, 5
D	0.405	0.425	10.29	10.79	-
E	0.395	0.405	10.04	10.28	-
e	0.100 TYP		2.54 TYP		7
e_1	0.200 BSC		5.08 BSC		7
H_1	0.045	0.055	1.15	1.39	-
J_1	0.095	0.105	2.42	2.66	-
L	0.175	0.195	4.45	4.95	-
L_1	0.090	0.110	2.29	2.79	4, 6
L_2	0.050	0.070	1.27	1.77	-
L_3	0.315	-	8.01	-	2

NOTES:

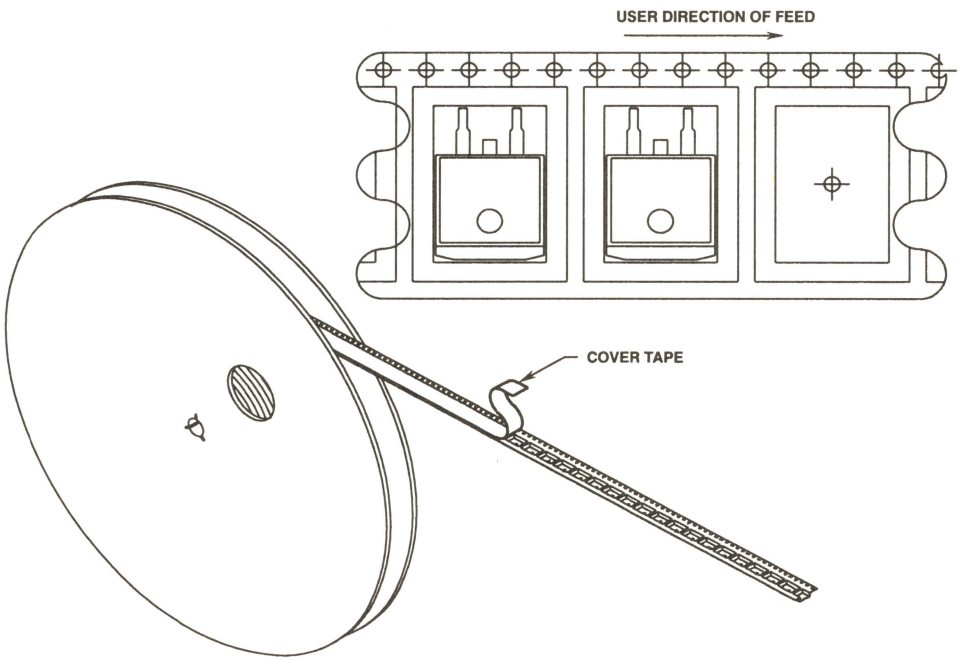
1. These dimensions are within allowable dimensions of Rev. C of JEDEC TO-263AB outline dated 2-92.
2. L_3 and b_2 dimensions established a minimum mounting surface for terminal 4.
3. Solder finish uncontrolled.
4. Dimension (without solder).
5. Add typically 0.0006 inches (0.015mm) for solder plating.
6. L_1 is the terminal length for soldering.
7. Position of lead to be measured 0.120 inches (3.05mm) from bottom of dimension D.
8. Controlling dimension: Inch.
9. Revision 5 dated 4-5-95.

Plastic Packages

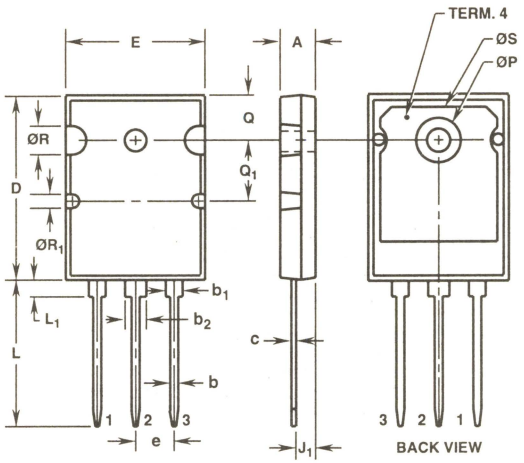
TO-263AB
24mm TAPE AND REEL



GENERAL INFORMATION
1. USE "9A" SUFFIX ON PART NUMBER.
2. 800 PIECES PER REEL.
3. ORDER IN MULTIPLES OF FULL REELS ONLY.
4. MEETS EIA-481 REVISION "A" SPECIFICATIONS.



Plastic Packages



TO-264AA

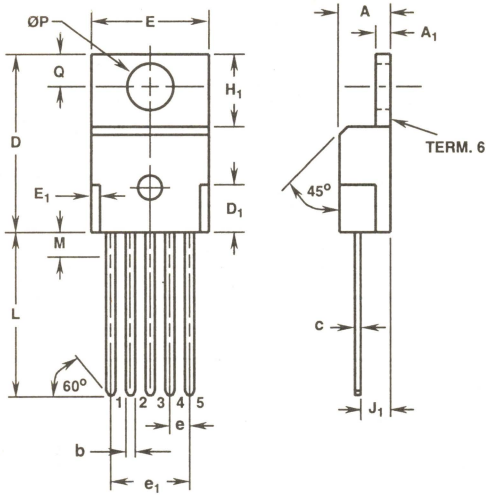
3 LEAD JEDEC TO-264AA PLASTIC PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.185	0.209	4.70	5.31	-
b	0.037	0.055	0.94	1.40	3, 4
b_1	0.087	0.102	2.21	2.59	2, 3
b_2	0.110	0.126	2.79	3.20	2, 3
c	0.017	0.029	0.43	0.74	2, 3, 4
D	1.007	1.047	25.58	26.59	-
E	0.760	0.799	19.30	20.29	-
e	0.215 BSC		5.46 BSC		5
J_1	0.102	0.118	2.59	3.00	6
L	0.779	0.842	19.79	21.39	-
L_1	0.087	0.102	2.21	2.59	2
ØP	0.122	0.138	3.10	3.51	-
Q	0.240	0.256	6.10	6.50	-
Q_1	0.330	0.346	8.38	8.79	-
ØR	0.155	0.187	3.94	4.75	-
$ØR_1$	0.085	0.093	2.16	2.36	-
ØS	0.270	0.280	6.87	7.12	-

NOTES:

1. These dimensions are within allowable dimensions of Rev. B of JEDEC TO-264AA outline dated 11-93.
2. Lead dimension and finish uncontrolled in L_1.
3. Lead dimension (without solder).
4. Add typically 0.002 inches (0.05mm) for solder coating.
5. Position of lead to be measured 0.250 inches (6.35mm) from bottom of dimension D.
6. Position of lead to be measured 0.100 inches (2.54mm) from bottom of dimension D.
7. Controlling dimension: Inch.
8. Revision 1 dated 5-95.

Plastic Packages



TS-001AA

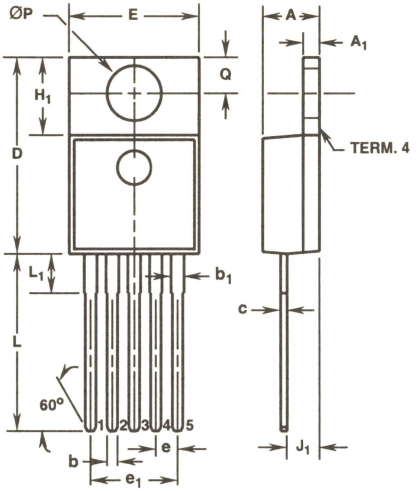
5 LEAD JEDEC TS-001AA PLASTIC PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.170	0.180	4.32	4.57	-
A_1	0.048	0.052	1.22	1.32	-
b	0.030	0.034	0.77	0.86	3, 4
c	0.014	0.019	0.36	0.48	2, 3, 4
D	0.590	0.610	14.99	15.49	-
D_1	-	0.160	-	4.06	-
E	0.395	0.410	10.04	10.41	-
E_1	-	0.030	-	0.76	-
e	0.067 TYP		1.70 TYP		5
e_1	0.268 BSC		6.80 BSC		5
H_1	0.235	0.255	5.97	6.47	-
J_1	0.100	0.110	2.54	2.79	6
L	0.530	0.550	13.47	13.97	-
M	0.130	0.150	3.31	3.81	2
ØP	0.149	0.153	3.79	3.88	-
Q	0.102	0.112	2.60	2.84	-

NOTES:

1. These dimensions are within allowable dimensions of Rev. A of JEDEC TS-001AA outline dated 8-89.
2. Lead finish uncontrolled in zone M.
3. Lead dimension (without solder).
4. Add typically 0.002 inches (0.05mm) for solder coating.
5. Position of lead to be measured 0.250 inches (6.35mm) from bottom of dimension D.
6. Position of lead to be measured 0.100 inches (2.54mm) from bottom of dimension D.
7. Controlling dimension: Inch.
8. Revision 3 dated 12-93.

Plastic Packages



TS-001AA (ALTERNATE VERSION)
5 LEAD JEDEC TS-001AA PLASTIC PACKAGE

SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.170	0.180	4.32	4.57	-
A_1	0.048	0.052	1.22	1.32	-
b	0.030	0.034	0.77	0.86	2, 3
b_1	0.031	0.041	0.79	1.04	2
c	0.018	0.022	0.46	0.55	2, 3
D	0.590	0.610	14.99	15.49	-
E	0.395	0.405	10.04	10.28	-
e	0.067 TYP		1.70 TYP		4
e_1	0.268 BSC		6.80 BSC		4
H_1	0.235	0.255	5.97	6.47	-
J_1	0.095	0.105	2.42	2.66	5
L	0.530	0.550	13.47	13.97	-
L_1	0.110	0.130	2.80	3.30	-
ØP	0.149	0.153	3.79	3.88	-
Q	0.105	0.115	2.66	2.92	-

NOTES:

1. These dimensions are within allowable dimensions of Rev. A of JEDEC TS-001AA outline dated 8-89.
2. Lead dimension (without solder).
3. Add typically 0.0006 inches (0.015mm) for solder plating.
4. Position of lead to be measured 0.250 inches (6.35mm) from bottom of dimension D.
5. Position of lead to be measured 0.100 inches (2.54mm) from bottom of dimension D.
6. Controlling dimension: Inch.
7. Revision 1 dated 12-20-94.

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HOW TO USE HARRIS AnswerFAX

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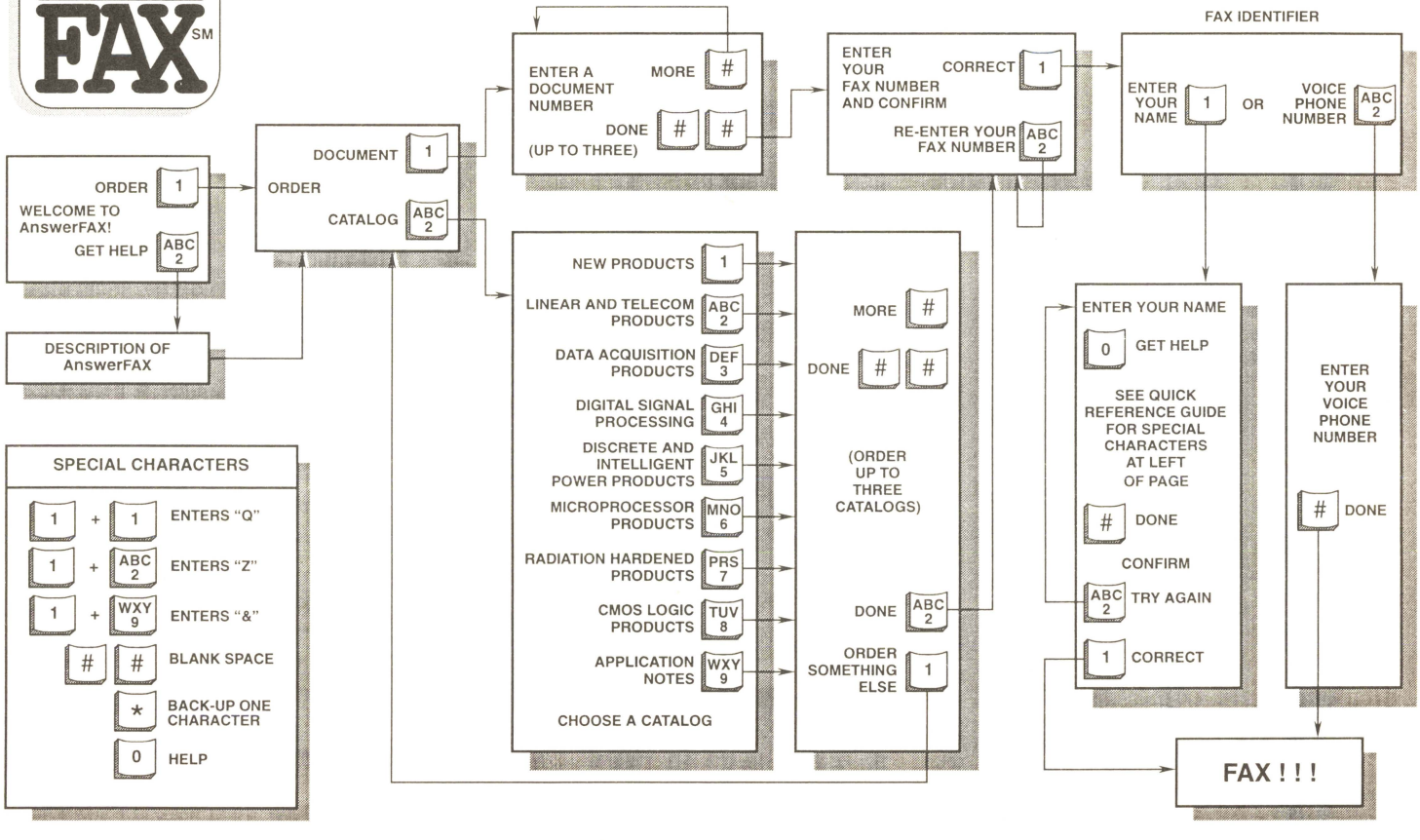

HARRIS SEMICONDUCTOR

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✓	PUB. NUMBER	DATA BOOK/DESCRIPTION
	7004	Complete Set of Commercial Harris Data Books
	7005	Complete Set of Commercial and Military Harris Data Books
	DB223B	**POWER MOSFETs** (1994: 1,328pp) This data book contains detailed technical information including standard power MOSFETs (the popular RF-series types, the IRF-series of industry replacement types, and JEDEC types), MegaFETs, logic-level power MOSFETs (L2FETs), ruggedized power MOSFETs, advanced discrete, high-reliability and radiation-hardened power MOSFETs.
	DB235B	**RADIATION HARDENED** (1993: 2,232pp) Harris technologies used include dielectric isolation (DI), Silicon-on-Sapphire (SOS), and Silicon-on-Insulator (SOI). The Harris radiation-hardened products include the CD4000, HCS/HCTS and ACS/ACTS logic families, SRAMs, PROMs, op amps, analog multiplexers, the 80C85/80C86 microprocessor family, analog switches, gate arrays, standard cells and custom devices.
	DB260.2	**CDP6805 CMOS MICROCONTROLLERS & PERIPHERALS** (1995: 436pp) This data book represents the full line of Harris Semiconductor CDP6805 products for commercial applications and supersedes previously published CDP6805 data books under the Harris, GE, RCA or Intersil names.
	DB301B	**DATA ACQUISITION** (1994: 1,104pp) Product specifications on A/D converters (display, integrating, successive approximation, flash); D/A converters, switches, multiplexers, and other products.
	DB302B	**DIGITAL SIGNAL PROCESSING** (1994: 528pp) Product specifications on one-dimensional and two-dimensional filters, signal synthesizers, multipliers, special function devices (such as address sequencers, binary correlators, histogrammer).
	DB303	**MICROPROCESSOR PRODUCTS** (1992: 1,156pp) For commercial and military applications. Product specifications on CMOS microprocessors, peripherals, data communications, and memory ICs.
	DB304.1	**INTELLIGENT POWER ICs** (1994: 946pp) This data book includes a complete set of data sheets for product specifications, application notes with design details for specific applications of Harris products, and a description of the Harris quality and high reliability program.
	DB309.1	**MCT/IGBT/DIODES** (1995: est 700pp) This MCT/IGBT/Diodes Databook represents the full line of these products made by Harris Semiconductor Discrete Power Products for commercial applications.
	DB450.4	**TRANSIENT VOLTAGE SUPPRESSION DEVICES** (1995: 400pp) Product specifications of Harris varistors and surgectors. Also, general informational chapters such as: "Voltage Transients - An Overview," "Transient Suppression - Devices and Principles," "Suppression - Automotive Transients."
	DB500B	**LINEAR AND TELECOM ICs** (1993: 1,312pp) Product specifications for: op amps, comparators, S/H amps, differential amps, arrays, special analog circuits, telecom ICs, and power processing circuits.
	Digital Military	**DIGITAL MILITARY** (1989: 680pp) Harris CMOS digital ICs – microprocessors, peripherals, data communications and memory – are included in this data book.
	Analog Military	**ANALOG MILITARY** (1989: 1,264pp) This data book describes Harris' military line of Linear, Data Acquisition, and Telecommunications circuits.
	DB312	**ANALOG MILITARY DATA BOOK SUPPLEMENT** (1994: 432pp) The 1994 Military Data Book Supplement, combined with the 1989 Analog Military Product Data Book, contain detailed technical information on the extensive line of Harris Semiconductor Linear and Data Acquisition products for Military (MIL-STD-883, DESC SMD and JAN) applications and supersedes all previously published Linear and Data Acquisition Military data books. For applications requiring Radiation Hardened products, please refer to the 1993 Harris Radiation Hardened Product Data Book (document #DB235B)
	PSG201.22	**PRODUCT SELECTION GUIDE** (1995: 816pp) Key product information on all Harris Semiconductor devices. Sectioned (Linear, Data Acquisition, Digital Signal Processing, Telecom, Intelligent Power, Discrete Power, Digital Microprocessors and Hi-Rel/Military and Rad Hard) for easy use and includes cross references and alphanumeric part number index.
	SG103	**CMOS LOGIC SELECTION GUIDE** (1994: 288pp) This product selection guide contains technical information on Harris Semiconductor High Speed 54/74 CMOS Logic Integrated Circuits for commercial, industrial and military applications. It covers Harris' High Speed CMOS Logic HC/HCT Series, AC/ACT Series, BiCMOS Interface Logic FCT Series and CMOS Logic CD4000B Series.

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AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
27007	BR007	Complete Listing of Harris Sales Offices, Representatives and Authorized Distributors World Wide (7 pages)
7031	-	Harris Semiconductor Part Number Nomenclature Guide (16 pages)
27026	BR026	Linear and Data Acquisition Product Cross Reference (26 pages)
7051	-	High Speed Data Converters A/D, D/A Cross Reference (1 pages)
5295108	-	HIN230/240 Interface Family and DG400 Cross Reference (2 pages)
7022	-	Harris Semiconductor DG4XX Extended Processing Flow (2 pages)
DATA ACQUISITION ARTICLE REPRINTS		
7029	Electronic Design 3-20-95	Decipher High-Sample-Rate ADC Specs (8 pages)
DATA ACQUISITION PACKAGING INFORMATION		
7015	DB301, Section 17	Data Acquisition Packaging Information (36 pages)
DATA ACQUISITION DATA SHEETS		
3171	AD590	2 Wire Current Output Temperature Transducer (10 pages)
3094	ADC0802, ADC0803, ADC0804	8-Bit uP Compatible A/D Converters (16 pages)
3104	AD7520, AD7530, AD7521, AD7531	10-Bit, 12-Bit Multiplying D/A Converters (8 pages)
3105	AD7523, AD7533	8-Bit Multiplying D/A Converters (8 pages)
3107	AD7541	12-Bit Multiplying D/A Converter (7 pages)
3108	AD7545	12-Bit Buffered Multiplying CMOS DAC (7 pages)
1079	CA3161	BCD to Seven Segment Decoder/ Driver (3 pages)
1080	CA3162	A/D Converter for 3-Digit Display (7 pages)
1790	CA3304	CMOS Video-Speed 4-Bit Flash A/D Converter (11 pages)
3102	CA3306	CMOS Video Speed 6-Bit Flash A/D Converter (15 pages)
3095	CA3310, CA3310A	CMOS 10-Bit A/D Converter with Internal Track and Hold (15 pages)
3103	CA3318C	CMOS Video Speed 8-Bit Flash A/D Converter (12 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
1850	CA3338, CA3338A	CMOS Video Speed 8-Bit R2R D/A Converter (7 pages)
3114	DG181 thru DG191	High-Speed Drivers with JFET Switch (9 pages)
3115	DG200, DG201	CMOS Dual/Quad SPST Analog Switches (8 pages)
3117	DG201A, DG202	Quad SPST CMOS Analog Switches (4 pages)
3118	DG211, DG212	SPST 4 Channel Analog Switch (5 pages)
3119	DG300A, DG301A, DG302A, DG303A	TTL Compatible CMOS Analog Switches (7 pages)
3120	DG308A, DG309	Quad Monolithic SPST SMOS Analog Switches (5 pages)
3284	DG401, DG403, DG405	Monolithic CMOS Analog Switches (12 pages) FN3284.3
3703	DG401/883, DG403/883, DG405/883	Monolithic CMOS Analog Switches (12 pages)
3116	DG406, DG407	Single 16-Channel/Differential 8-Channel CMOS Analog Multiplexers (2 pages)
3720	DG406/883, DG407/883	Single 16-Channel/Differential 8-Channel CMOS Analog Multiplexers (1 pages)
3283	DG408, DG409	Single 8-Channel/Differential 4-Channel CMOS Analog Multiplexers (16 pages)
3688	DG408/883, DG409/883	Single 8-Channel/Differential 4-Channel CMOS Analog Multiplexers (14 pages)
3282	DG411, DG412, DG413	Monolithic Quad SPST CMOS Analog Switches (11 pages) FN3282.3
3681	DG411/883, DG412/883, DG413/883	Monolithic Quad SPST CMOS Analog Switches (10 pages)
3281	DG441, DG442	Monolithic Quad SPST CMOS Analog Switches (12 pages)
3687	DG441/883, DG442/883	Monolithic Quad SPST CMOS Analog Switches (12 pages)
3586	DG444, DG445	Monolithic Quad SPST CMOS Analog Switches (12 pages)
3280	DG458, DG459	Single 8-Channel/Differential 4-Channel Fault Protected Analog Multiplexers (13 pages)
3708	DG458/883, DG459/883	Single 8-Channel/Differential 4-Channel Fault Protected Analog Multiplexers (1 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
3137	DG506A, DG507A, DG508A, DG509A	CMOS Analog Multiplexers (13 pages)
3139	DG526, DG527, DG528, DG529	Analog CMOS Latchable Multiplexers (16 pages)
3389	HA7210	Low Power Crystal Oscillator (13 pages)
2494	HBC2500	3um BiMOS-E Analog/Digital Library (8 pages)
3121	HI-200, H-201	Dual/Quad SPST CMOS Analog Switches (9 pages)
3123	HI-201HS	High Speed Quad SPST CMOS Analog Switch (9 pages)
3124	HI-222	High Frequency/Video Switch (8 pages)
3125	HI-300 thru HI-307	CMOS Analog Switches (10 pages)
3126	HI-381 thru HI-390	CMOS Analog Switches (7 pages)
3142	HI-506, HI-507, HI-508, HI-509	Single 16 and 8/Differential 8 and 4 Channel CMOS Analog Multiplexers (17 pages)
3143	HI-506A, HI-507A, HI-508A, HI-509A	16 Channel, 8 Channel, Differential 8 and Differential 4 Channel, CMOS Analog MUXs with Active Overvoltage Protection (14 pages)
3146	HI-516	16 Channel/Differential 8 Channel CMOS High Speed Analog Multiplexer (7 pages)
3147	HI-518	8 Channel/Differential 4 Channel CMOS High Speed Analog Multiplexer (7 pages)
3148	HI-524	4 Channel Wideband and Video Multiplexer (6 pages)
3149	HI-539	Monolithic, 4 Channel, Low Level, Differential Multiplexer (11 pages)
3150	HI-546, H-547, H-548, HI-549	Single 16 and 8, Differential 8 and 4 Channel CMOS Analog MUXs with Active Overvoltage Protection (15 pages)
3580	HI-562A	12-Bit High Speed Monolithic D/A Converter (6 pages)
3109	HI-565A	High Speed Monolithic D/A Converter with Reference (8 pages)
3096	HI-574A, HI-674A, HI-774	Complete 12-Bit A/D Converter with Microprocessor Interface (18 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
3579	HI1166	8-Bit, 250MSPS Flash A/D Converter (12 pages)
3960	HI1166Y	8-Bit 250 MSPS Flash A/D Converter (8 pages)
3662	HI1171	8-Bit, 40MSPS High Speed D/A Converter (8 pages)
3577	HI1175	8-Bit, 20MSPS Flash A/D Converter (9 pages)
3582	HI1176	8-Bit, 20 MSPS Flash A/D Converter (12 pages) FN3582.2
3666	HI1179	8-Bit, 35 MSPS Video A/D Converter (14 pages)
3578	HI1276	8-Bit, 500MSPS Flash A/D Converter (11 pages)
3958	HI1276Y	8-Bit 500 MSPS Flash A/D Converter (8 pages)
3583	HI1386	8-Bit, 75MSPS Flash A/D Converter (8 pages)
3959	HI1386Y	8-Bit, 75 MSPS Flash A/D Converter (8 pages)
3576	HI1396	8-Bit, 125MSPS Flash A/D Converter (9 pages)
3954	HI1396Y	8-Bit, 125 MSPS Flash A/D Converter (8 pages)
3141	HI-1818A, HI-1828A	Low Resistance, Single 8 Channel and Differential 4 Channel CMOS Analog Multiplexers (8 pages)
3936	HI3050	10-Bit, 50 MSPS High Speed 3-Channel D/A Converter (12 pages)
3127	HI-5040 thru HI-5051, HI-5046A and HI-5047A	CMOS Analog Switches (11 pages)
3174	HI-5700	8-Bit, 20MSPS Flash A/D Converter (12 pages)
3286	HI-5700/883	8-Bit, 20 MSPS Flash A/D Converter (8 pages)
2937	HI-5701	6-Bit, 30MSPS Flash A/D Converter (12 pages)
3378	HI-5701/883	6-Bit, 30 MSPS Flash A/D Converter (8 pages)
3745	HI5702	10-Bit, 40 MSPS A/D Converter (14 pages)
3950	HI5703	10-Bit, 40 MSPS A/D Converter (11 pages)
3921	HI5710	10-Bit, 20 MSPS A/D Converter (16 pages)
3973	HI5714	8-Bit, 75 MSPS A/D Converter (12 pages) FN3973

Data Acquisition Product Listing

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
3949	HI5721	10-Bit, 125 MSPS High Speed D/A Converter (16 pages) FN3949.3
2938	HI5800	12-Bit, 3 MSPS Sampling A/D Converter (15 pages) FN2938.6
3287	HI5801	12-Bit, 5MSPS A/D Converter (1 pages)
3633	HI5810	CMOS 10us 12-Bit Sampling A/D Converter with Internal Track and Hold (13 pages)
3214	HI5812	CMOS 20us 12-Bit Sampling A/D Converter with Internal Track and Hold (14 pages)
3634	HI5813	CMOS 3.3V, 25us 12-Bit Sampling A/D Converter with Internal Track and Hold (15 pages)
3664	HI5816	CMOS 12-Bit Sampling A/D Converter with Serial Data Output and Internal Track and Hold (16 pages)
3373	HI7131, HI7133	3 1/2 Digit Low Power, High CMRR LCD/LED Display Type A/D Converter (21 pages)
3099	HI-7151	10-Bit High Speed A/D Converter with Trach and Hold (17 pages)
3100	HI-7152	10-Bit High Speed A/D Converter with Track and Hold (17 pages)
2787	HI-7153	8 Channel, 10-Bit High Speed Sampling A/D Converter (17 pages)
3285	HI-7153/883	8-Channel, 10-Bit, High Speed Sampling A/D Converter (12 pages)
2936	HI-7159A	Microprocessor Compatible 5 1/2 Digit A/D Converter (14 pages)
3612	HI7190	24-Bit High Precision Sigma-Delta A/D Converter (1 pages)
3581	HI20201, HI20203	10/8-Bit, 160MSPS Ultra High Speed D/A Converter (12 pages)
3110	HI-DAC80V, HI-DAC85V	12-Bit, Low Cost, Monolithic D/A Converter (7 pages)
3138	HIN230 thru HIN241	+5V Powered RS-232 Transmitters/ Receivers (20 pages)
3020	ICL232	+5V Powered Dual RS-232 Transmitter/Receiver (5 pages)
3082	ICL7106, ICL7107	3 1/2 Digit LCD/LED Display A/D Converter (13 pages)
3092	ICL7109	12-Bit Microprocessor Compatible A/D Converter (23 pages)
3639	ICL7112	12-Bit High-Speed CMOS uP-Compatible A/D Converter (13 pages)
3101	ICL7115	14-Bit High-Speed CMOS uP-Compatible A/D Converter (14 pages)
3083	ICL7116, ICL7117	3 1/2 Digit LCD/LED Display A/D Converter with Display Hold (12 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
3112	ICL7121	16-Bit Multiplying Microprocessor-Compatible D/A Converter (7 pages)
3084	ICL7126	3 1/2 Digit Low Power Single-Chip A/D Converter (14 pages)
3085	ICL7129	4 1/2 Digit LCD Single-Chip A/D Converter (10 pages)
3113	ICL7134	14-Bit Multiplying uP-Compatible D/A Converter (15 pages)
3093	ICL7135	4 1/2 Digit BCD Output A/D Converter (14 pages)
3086	ICL7136, ICL7137	3 1/2 Digit LCD/LED Low Power Display A/D Converter with Overrange Recovery (15 pages)
3088	ICL7139, ICL7149	3 3/4 Digit Autoranging Multimeter (13 pages)
3181	ICL7662	CMOS Voltage Converter (10 pages)
3182	ICL7665S	CMOS Micropower Over/Under Voltage Detector (13 pages)
3081	ICL8052/ ICL71C03, ICL8068/ ICL71C03	Precision 4 1/2 Digit A/D Converter (21 pages)
3091	ICL8052/ ICL7104, ICL8068/ ICL7104	14/16-Bit uP-Compatible 2-Chip A/D Converter (21 pages)
3172	ICL8069	Low Voltage Reference (4 pages)
3019	ICM7170	uP-Compatible Real-Time Clock (13 pages)
3163	ICM7207, ICM7207A	CMOS Timebase Generator (6 pages)
3164	ICM7208	7-Digit LED Display Counter (7 pages)
3158	ICM7211, ICM7212	4-Digit ICM7211 (LCD) and ICM7212 (LED) Display Drivers (13 pages)
3165	ICM7213	One Second/One Minute Timebase Generator (6 pages)
3166	ICM7216A, ICM7216B, ICM7216D	8-Digit Multi-Function Frequency Counter/Timer (17 pages)
3167	ICM7217	4-Digit LED Display Programmable Up/ Down Counter (18 pages)
3168	ICM7224	4 1/2 Digit LCD Display Counter (7 pages)
3169	ICM7226A, ICM7226B	8-Digit Multi-Function Frequency Counter/Timers (18 pages)
3160	ICM7228	8-Digit uP Compatible LED Display Decoder Driver (18 pages)
3161	ICM7231, ICM7232	Numeric/Alphanumeric Triplexed LCD Display Driver (15 pages)

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AnswerFAX Technical Support Data Acquisition Product Listing

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3162	ICM7243	8-Character uP-Compatible LED Display Decoder Driver (12 pages)
3170	ICM7249	5 1/2 Digit LCD u-Power Event/Hour Meter (9 pages)
3128	IH401A	QUAD Varafet Analog Switch (5 pages)
3129	IH5009-12 IH5014, IH5016-20 IH5022, IH5024	Virtual Ground Analog Switch (7 pages)
3130	IH5043	Dual SPDT CMOS Analog Switch (7 pages)
3131	IH5052, IH5053	Quad CMOS Analog Switch (6 pages)
3132	IH5140 thru IH5145	High-Level CMOS Analog Switch (13 pages)
3133	IH5151	Dual SPDT CMOS Analog Switch (8 pages)
3134	IH5341, IH5352	Dual SPST, Quad SPST CMOS RF/ Video Switches (9 pages)
3156	IH6108	8-Channel CMOS Analog Multiplexer (10 pages)
3136	IH6201	Dual CMOS Driver/Voltage Translator (5 pages)
3157	IH6208	4-Channel Differential CMOS Analog Multiplexer (8 pages)
DATA ACQUISITION APPLICATION NOTES		
9001	AN001	Glossary of Data Conversion Terms (6 pages)
9002	AN002	Principles of Data Acquisition and Conversion (20 pages)
9004	AN004	The IH5009 Analog Switch Series (9 pages)
9009	AN009	Pick Sample-Holds by Accuracy and Speed and Keep Hold Capacitors in Mind (7 pages)
9012	AN012	Switching Signals with Semiconductors (4 pages)
9016	AN016	Selecting A/D Converters (7 pages)
9017	AN017	The Integrating A/D Converter (5 pages)
9018	AN018	Do's and Don'ts of Applying A/D Converters (4 pages)
9020	AN020	A Cookbook Approach to High Speed Data Acquisition and Microprocessor Interfacing (23 pages)
9023	AN023	Low Cost Digital Panel Meter Designs (5 pages)
9028	AN028	Build an Auto-Ranging DMM with the ICL7103A/8052A A/D Converter Pair (6 pages)
9030	AN030	ICL7104: A Binary Output A/D Converter for Microprocessors (16 pages)
9032	AN032	Understanding the Auto-Zero and Common Mode Performance of the ICL7106/7107/7109 Family (8 pages)
9042	AN042	Interpretation of Data Converter Accuracy Specifications (11 pages)
9043	AN043	Video Analog-to-Digital Conversion (6 pages)
9046	AN046	Building a Battery Operated Auto Ranging DVM with the ICL7106 (5 pages)
9047	AN047	Games People Play with Intersil's A/D Converter's (27 pages)
9048	AN048	Know Your Converter Codes (5 pages)
9049	AN049	Applying the 7109 A/D Converter (5 pages)
9051	AN051	Principles and Applications of the ICL7660 CMOS Voltage Converter (9 pages)
9052	AN052	Tips for Using Single Chip 3.5 Digit A/D Converters (9 pages)
9054	AN054	Display Driver Family Combines Convenience of Use with Microprocessor Interfaceability (18 pages)
9059	AN059	Digital Panel Meter Experiments for the Hobbyist (7 pages)
9517	AN517	Applications of Monolithic Sample and Hold Amplifier (5 pages)
9520	AN520	CMOS Analog Miltiplexers and Switches; Applications Considerations (9 pages)
9521	AN521	Getting the Most Out of CMOS Devices for Analog Switching Jobs (7 pages)
9522	AN522	Digital to Analog Converter Terminology (3 pages)
9524	AN524	Digital to Analog Converter High Speed ADC Applications (3 pages)
9531	AN531	Analog Switch Applications in A/D Data Conversion Systems (4 pages)
9532	AN532	Common Questions Concerning CMOS Analog Switches (4 pages)
9534	AN534	Additional Information on the HI-300 Series Switch (5 pages)
9535	AN535	Design Considerations for A Data Acquisition System (DAS) (7 pages)

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9538	AN538	Monolithic Sample/Hold Combines Speed and Precision (6 pages)
9539	AN539	A Monolithic 16-Bit D/A Converter (5 pages)
9543	AN543	New High Speed Switch Offers Sub-50ns Switching Times (7 pages)
9557	AN557	Recommended Test Procedures for Analog Switches (6 pages)
9559	AN559	HI-222 Video/HF Switch Optimizes Key Parameters (7 pages)
98759	AN8759	Low Cost Data Acquisition System Features SPI A/D Converter (9 pages)
99203	AN9203	Using the HI5800 Evaluation Board (13 pages)
99213	AN9213	Advantages and Application of Display Integrating A/D Converters (6 pages)
99214	AN9214	Using Harris High Speed A/D Converters (10 pages)
99215	AN9215	Using the HI-5700 Evaluaton Board (7 pages)
99216	AN9216	Using the HI5701 Evaluation Board (8 pages)
99309	AN9309	Using the HI5800/HI5801 Evaluation Board (8 pages)
99313	AN9313	Circuit Considerations in Imaging Applications (8 pages)
99316	AN9316	Power Supply Considerations for the HI-222 High Frequency Video Switch (2 pages)
99326	AN9326	A Complete Analog-to-Digital Converter Operating from a Single 3.3V Power Supply (4 pages)
99328	AN9328	Using the HI1166 Evaluation Board (9 pages)
99329	AN9329	Using the HI1176/HI1171 Evaluation Board (5 pages)
99330	AN9330	Using the HI1396 Evaluation Board (9 pages)
99331	AN9331	Using the HI1175 Evaluation Board (10 pages)
99332	AN9332	Using the HI1276 Evaluation Board (10 pages)
99333	AN9333	Using the HI1386 Adapter Board (2 pages)
99336	AN9336	Mult-Meter Display Converter Eases DMM Design (6 pages)
99337	AN9337	Reduce CMOS-Multiplexer Troubles Through Proper Device Selection (6 pages)
99402	AN9402	Keeping the HI-0201 Switch Closed When Removing the V+ Supply (1 pages)
99406	AN9406	Using the HI20201/03 Evaluation Kit (11 pages)
99407	AN9407	Using the HI1176/HI1179 Evaluation Board (13 pages)
99410	AN9410	Using The HI5721 Evaluation Module (11 pages) AN9410.1
99411	AN9411	Using the HI1171 Evaluation Kit (6 pages)
99412	AN9412	Using the HI5702 Evaluation Board (16 pages) AN9412.2
99413	AN9413	Driving the Analog Input of the HI5702 (3 pages)
99419	AN9419	Using the DAC Reconstruct Board (8 pages)
99501	AN9501	Understanding the HI5721 D/A Converter Spectral Specifications (3 pages) AN9501.1
99504	AN9504	A Brief Introduction to Sigma Delta Conversion (7 pages) AN9504
99505	AN9505	Using the HI7190 Evaluation Kit (11 pages)
99509	AN9509	Digital IF Sub Sampling Using the HI5702, HSP45116 and HSP43220 (5 pages) AN99509.1
DATA ACQUISITION TECH BRIEFS		
82322	TB322	Replacing an MP7684/MP7684A with an HI5700 (1 pages)
82323	TB323	Replacing an MP7682 with an HI5701 (1 pages)
82324	TB324	Clamping the Analog Input of the HI5800 (1 pages)
82325	TB325	Understanding Glitch In A High Speed D/A Converter (2 pages)
82326	TB326	Measuring Spurious Free Dynamic Range in a D/A Converter (2 pages)
82328	TB328	Setup and Hold Considerations When Using the HI5721 (2 pages)
82329	TB329	Harris Sigma-Delta Calibration Technique (3 pages) TB329
82330	TB330	Higher Speed Clock Rates Help Ease Filtering Requirements in Communication D/As (2 pages)
82331	TB331	Using the HI7190 Serial Interface (3 pages) TB331

Digital Signal Processing (DSP) Listing

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
27007	BR007	Complete Listing of Harris Sales Offices, Representatives and Authorized Distributors World Wide (8 pages)
7031	-	Harris Semiconductor Part Number Nomenclature Guide (16 pages)
DSP ARTICLE REPRINTS		
7006	DSP Applications, December 1993	Considerations in the Development of a Low Cost, High Performance Receiver Based on DSP Techniques (14 pages)
7007	Electronic Products, April 1994	DSP Chips For IF Processing (4 pages)
7008	Asian Electronics Engineer, March 1994	Comparing Digital Filtering Techniques (5 pages)
7009	Nikkei Business Publications	Harris Offers RF, IF Signal Processing ICs for 900MHz Wireless Uses (2 pages)
7010	Electronic Design 7/11/94	Use DSP Filter Concepts in IF System Design (7pages)
7011	Electronic Design 11/11/93	Improved DSP ICs Eye New Horizons (9 pages)
7028	Electronic Design 10/25/95	Communications-Targeted DSP Chips Delover Top Throughput (1 page)
DSP PACKAGING INFORMATION		
7016	DB302, Section 11	Digital Signal Processing Packaging Information (13 pages)
DSP DATA SHEETS		
2806	HMA510	16 x 16-Bit CMOS Parallel Multiplier Accumulator (7 pages)
2807	HMA510/883	16 x 16-Bit CMOS Parallel Multiplier Accumulator (5 pages)
2803	HMU16, HMU17	16 x 16-Bit CMOS Parallel Multipliers (10 pages)
2804	HMU16/883	16 x 16-Bit CMOS Parallel Multiplier (6 pages)
2805	HMU17/883	16 x 16-Bit CMOS Parallel Multiplier (6 pages)
2786	HSP9501	Programmable Data Buffer (7 pages)
2811	HSP9520, HSP9521	Multilevel Pipeline Registers (4 pages)
3555	HSP43124	Serial I/O Filter (16 pages)
2808	HSP43168	Dual FIR Filter (20 pages)
3177	HSP43168/883	Dual FIR Filter (8 pages)
3365	HSP43216	Halfband Filter (17 pages)
2486	HSP43220	Decimating Digital Filter (23 pages)
2802	HSP43220/883	Decimating Digital Filter (7 pages)
2759	HSP43481	Digital Filter (14 pages)
2450	HSP43481/883	Digital Filter (6 pages)
2758	HSP43881	Digital Filter (15 pages)
2449	HSP43881/883	Digital Filter (6 pages)
2785	HSP43891	Digital Filter (16 pages)
2451	HSP43891/883	Digital Filter (6 pages)
2810	HSP45102	12-Bit Numerically Controlled Oscillator (7 pages)
2809	HSP45106	16-Bit Numerically Controlled Oscillator (10 pages)
2815	HSP45106/883	16-Bit Numerically Controlled Oscillator (6 pages)
2485	HSP45116	Numerically Controlled Oscillator/ Modulator (25 pages)
2813	HSP45116/883	Numerically Controlled Oscillator/ Modulator (7 pages)
2489	HSP45240	Address Sequencer (12 pages)
2816	HSP45240/883	Address Sequencer (6 pages)
2814	HSP45256	Binary Correlator (13 pages)
2997	HSP45256/883	Binary Correlator (18 pages)
3627	HSP48212	Digital Video Mixer (11 pages)
3185	HSP48410	Histogrammer/Accumulating Buffer (11 pages)
3542	HSP48410/883	Histogrammer/Accumulating Buffer (15 pages)
2459	HSP48901	3 x 3 Image Filter (9 pages)
2456	HSP48908	Two Dimensional Convolver (17 pages)
2783	HSP48908/883	Two Dimensional Convolver (7 pages)
3288	HSP50016	Digital Down Converter (24 pages)
3651	HSP50110	Digital Quadrature Tuner (23 pages)
3652	HSP50210	Digital Costas Loop (38 pages)

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Digital Signal Processing (DSP) Listing

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
DSP DEVELOPMENT TOOLS		
3368	DECI•MATE™	Harris HSP43220 Decimating Digital Filter Development Software (4 pages)
3366	HSP-EVAL	DSP Evaluation Platform (12 pages)
3367	HSP45116-DB	HSP45116 Daughter Board (12 pages)
3637	HSP50016-EV	DDC Evaluation Platform (18 pages)
DSP APPLICATION NOTES		
9113	AN113	Some Applications of Digital Signal Processing Techniques to Digital Video (5 pages)
9114	AN114	Real-Time Two-Dimensional Spatial Filtering with the Harris Digital Filter Family (43 pages)
9115	AN115	Digital Filter (DF) Family Overview (6 pages)
9116	AN116	Extended Digital Filter Configurations (10 pages)
99102	AN9102	Noise Aspects of Applying Advanced CMOS Semiconductors (9 pages)
99403	AN9403	Predicting Data Throughput in the Harris HSP43220 (5 pages)
99205	AN9205	Timing Relationships for HSP45240 (2 pages)
99206	AN9206	Correlating on Extended Data Lengths (2 pages)
99207	AN9207	Temperature Considerations (2 pages)
99401	AN9401	Reducing the Mimimum Decimation Rate of the HSP50016 Digital Down Converter (10 pages)
99418	AN9418	HSP43168 Configured to Perform Complex Filtering (5 pages)
99509	AN9509	Digital IF Sub Sampling Using the HI5702, HSP45116 and HSP43220 (5 pages) AN99509.1

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
DSP TECH BRIEFS		
8252	TB52	Electrostatic Discharge Control a Guide to Handling Integrated Circuits (2 pages)
82303	TB303	HSP45256 Correction to Data Sheet (1 page)
82305	TB305	Histogramming with a Variable Pixel Increment (2 pages)
82306	TB306	Cascading Multiple HSP45256 Correlators (2 pages)
82307	TB307	Correlation with Multibit Data using the HSP45256 (2 pages)
82308	TB308	HSP43220 Deci•Mate Design Rule Checks (2 pages)
82309	TB309	Notes on using the HSP43220 (3 pages)
82310	TB310	Common Abuses of the HSP43220 (1 page)
82311	TB311	HSP43220 - Design of Filters with Output Rates <2 (Passband + Transition) (2 pages)
82312	TB312	HDF Bypass in the HSP43220 (1 page)
82313	TB313	Reading Out FIR Coefficients from the HSP43220 (1 page)
82314	TB314	Quadrature Down Conversion with the HSP45116, HSP43168 and HSP43220 (7 pages)
82315	TB315	Processing Signals at Increased Sample Rates with Mulitple HSP45116's (1 page)
82316	TB316	Pipeline Delay Through the HSP45116 (1 pages)
82317	TB317	Pipeline Delay Through the HSP45106 (2 pages)
82318	TB318	The NCO as a Stable, Accurate Synthesizer (3 pages)
82319	TB319	Reading the Phase Accumulator of the HSP45106 (2 pages)
82327	TB327	Using the HSP45116 as a Complex Multiplier Accumulator (4 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
27007	BR007	Complete Listing of Harris Sales Offices, Representatives and Authorized Distributors World Wide (7 pages)
7031	-	Harris Semiconductor Part Number Nomenclature Guide (16 pages)
27026	BR026	Linear and Data Acquisition Product Cross Reference (26 pages)
7030	Wireless Design & Development 6/6/95	System Considerations in Spread-Spectrum Designs (3 pages)
LINEAR PACKAGING INFORMATION		
7014	DB500, Section 11	Linear and Telecom Packaging Information (19 pages)
LINEAR DATA SHEETS		
796	CA124, CA224, CA324, LM324*, LM2902*	Quad Operational Amplifiers for Commercial, Industrial and Military Applications (7 pages)
795	CA139, CA239, CA339, LM339, LM2901, LM3302	Quad Voltage Comparators for Industrial, Commercial and Military Applications (5 pages)
1019	CA158, CA258, CA358, CA2904, LM358*, LM2904*	Dual Operational Amplifiers for Commercial, Industrial and Military Applications (11 pages)
834	CA555, LM555	Timers for Timing Delays and Oscillator Applications in Commercial, Industrial and Military Equipment (6 pages)
531	CA741, CA1458, CA1558, LM741*, LM1458*, LM1558*	High Gain Single and Dual Operational Amplifiers for Military, Industrial and Commercial Applications (6 pages)
981	CA1391, CA1394	TV Horizontal Processors (4 pages)
338	CA3018	General Purpose Transistor Arrays (6 pages)
339	CA3020	Multipurpose Wide-Band Power Amps Military, Industrial and Commercial Equipment at Frequency Up to 8MHz (9 pages)
382	CA3028, CA3053	Differential/Cascode Amplifiers for Commercial and Industrial Equipment for DC to 120MHz (12 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
343	CA3039	Diode Array (4 pages)
341	CA3045, CA3046	General Purpose N-P-N Transistor Arrays (6 pages)
611	CA3049, CA3102	Dual High Frequency Differential Amplifiers for Low Power Applications Up to 500MHz (9 pages)
388	CA3054	Transistor Array - Dual Independent Differential Amp for Low Power Applications for DC to 120MHz (8 pages)
490	CA3059, CA3079	Zero-Voltage Switches for 50-60Hz and 400Hz Thyristor Control Applications (12 pages)
537	CA3060	Operational Transconductance Amplifier Arrays (12 pages)
535	CA3078	Micropower Operational Amplifier (9 pages)
475	CA3080	Operational Transconductance Amplifier (OTA) (13 pages)
480	CA3081, CA3082	General Purpose High Current N-P-N Transistor Arrays (3 pages)
481	CA3083	General Purpose High Current N-P-N Transistor Array (4 pages)
483	CA3086	General Purpose N-P-N Transistor Array (5 pages)
561	CA3089	FM IF System (7 pages)
598	CA3094	Programmable Power Switch/ Amplifier for Control and General Purpose Applications (15 pages)
595	CA3096	N-P-N/P-N-P Transistor Array (13 pages)
896	CA3098	Programmable Schmitt Trigger - with Memory Dual Input Precision Level Detectors (10 pages)
625	CA3100	Wideband Operational Amplifier (7 pages)
860	CA3126	TV Chroma Processor (9 pages)
662	CA3127	High Frequency N-P-N Transistor Array (6 pages)
817	CA3130	BiMOS Operational Amplifier with MOSFET Input/CMOS Output (15 pages)

*Technical Data on LM Branded Types is Identical to the Corresponding CA Branded Types

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
975	CA3140	BiMOS Operational Amplifier with MOSFET Input/Bipolar Output (20 pages)
906	CA3141	High-Voltage Diode Array for Commercial, Industrial and Military Applications (3 pages)
532	CA3146, CA3183	High-Voltage Transistor Arrays (10 pages)
976	CA3160	BiMOS Operational Amplifiers with MOSFET Input/CMOS Output (17 pages)
1046	CA3189	FM IF System (7 pages)
1249	CA3193	BiCMOS Precision Operational Amplifiers (11 pages)
1270	CA3194	Single Chip PAL Luminance/Chroma Processor (9 pages)
1332	CA3217	Single Chip TV Chroma/Luminance Processor (9 pages)
1345	CA3227, CA3246	High-Frequency N-P-N Transistor Arrays for Low Power Applications at Frequencies Up to 1.5GHz (5 pages)
1480	CA3237	IR Remote-Control Amplifier (5 pages)
1050	CA3240	Dual BiMOS Operational Amplifier with MOSFET Input/Bipolar Output (16 pages)
1769	CA3256	BiMOS Analog Video Switch and Amplifier (12 pages)
1266	CA3260	BiMOS Operational Amplifier with MOSFET Input/CMOS Output (4 pages)
1174	CA3280	Dual Variable Operational Amplifier (11 pages)
1049	CA3290	BiMOS Dual Voltage Comparator with MOSFET Input, Bipolar Output (8 pages)
1320	CA3420	Low Supply Voltage, Low Input Current BiMOS Operational Amplifiers (5 pages)
1318	CA3440	Nanopower BiMOS Operational Amplifier (6 pages)
1732	CA3450	Video Line Driver, High Speed Operational Amplifier (8 pages)
1923	CA5130	BiMOS Microprocessor Operational Amplifier with MOSFET Input/CMOS Output (17 pages)
1924	CA5160	BiMOS Microprocessor Operational Amplifiers with MOSFET Input/ CMOS Output (20 pages)
1929	CA5260	BiMOS Microprocessor Operational Amplifiers with MOSFET Input/ CMOS Output (5 pages)
1925	CA5420	Low Supply Voltage, Low Input Current BiMOS Operational Amplifier (7 pages)
1946	CA5470	Quad Microprocessor BiMOS-E Operational Amplifiers with MOSFET Input/Bipolar Output (5 pages)
1076	CD22100	CMOS 4 x 4 Crosspoint Switch and Control Memory High-Voltage Type (20V Rating) (9 pages)
2871	CD22101, CD22102	CMOS 4 x 4 x 2 Crosspoint Switch with Control Memory (12 pages)
1310	CD22103A	CMOS HDB3 (High Density Bipolar 3) Transcoder for 2.048/8.448 Mb/s Transmission Applications (6 pages)
1695	CD22202, CD22203	5V Low Power DTMF Receiver (6 pages)
1696	CD22204	5V Low Power Subscriber DTMF Receiver (5 pages)
1368	CD22301	Monolithic PCM Repeater (5 pages)
2491	CD22M3493	12 x 8 x 1 BiMOS-E Crosspoint Switch (5 pages)
3587	CD22M3493 R2536	12 x 8 x 1 BiMOS-E Crosspoint Switch (7 pages)
2793	CD22M3494	16 x 8 x 1 BiMOS-E Crosspoint Switch (8 pages)
1682	CD22354A, CD22357A	CMOS Single-Chip, Full-Feature PCM CODEC (10 pages)
1686	CD22402	Sync Generator for TV Applications and Video Processing Systems (10 pages)
1257	CD22859	Monolithic Silicon COS/MOS Dual-Tone Multifrequency Tone Generator (5 pages)
1719	CD74HC22106, CD74HCT22106	QMOS 8 x 8 x 1 Crosspoint Switch with Memory Control (9 pages)
2891	HA-2400, HA-2404, HA-2405	PRAM Four Channel Programmable Amplifiers (6 pages)
3926	HA-2400/883	PRAM Four Channel Programmable Operational Amplifier (11 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
2892	HA-2406	Digitally Selectable Four Channel Operational Amplifier (6 pages)
2856	HA-2420, HA-2425	Fast Sample and Hold Amplifiers (9 pages)
2490	HA-2444	Selectable, Four Channel Video Operational Amplifier (3 pages)
3608	HA-2444/883	Selectable, Four Channel Video Operational Amplifier (8 pages)
2890	HA-2500, HA-2502, HA-2505	Precision High Slew Rate Operational Amplifiers (6 pages)
3734	HA-2500/883, HA-2502/883	Precision High Slew Rate Operational Amplifiers (10 pages)
2893	HA-2510, HA-2512, HA-2515	High Slew Rate Operational Amplifiers (5 pages)
3697	HA-2510/883, HA-2512/883	High Slew Rate Operational Amplifiers (11 pages)
2894	HA-2520, HA-2522, HA-2525	Uncompensated High Slew Rate Operational Amplifiers (7 pages)
3735	HA-2520/883, HA-2522/883	Uncompensated, High Slew Rate Operational Amplifiers (11 pages)
2895	HA-2529	Uncompensated, High Slew Rate High Output Current, Operational Amplifier (7 pages)
3736	HA-2529/883	Uncompensated, High Slew Rate High Output Current, Operational Amplifier (12 pages)
2896	HA-2539	Very High Slew Rate Wideband Operational Amplifier (7 pages)
3927	HA-2539/883	Very High Slew Rate Wideband Operational Amplifier (11 pages)
2897	HA-2540	Wideband, Fast Settling Operational Amplifier (8 pages)
2898	HA-2541	Wideband, Fast Settling, Unity Gain Stable, Operational Amplifier (8 pages)
3698	HA-2541/883	Wideband, Fast Settling, Unity Gain Stable, Operational Amplifier (11 pages)
2899	HA-2542	Wideband, High Slew Rate, High Output Current Operational Amplifier (10 pages)
3928	HA-2542/883	Wideband, High Slew Rate, High Output Current, Operational Amplifier (12 pages)

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2900	HA-2544	Video Operational Amplifier (10 pages)
3699	HA-2544/883	Video Operational Amplifier (13 pages)
2861	HA-2546	Wideband Two Quadrant Analog Multiplier (13 pages)
2444	HA-2546/883	Wideband Two Quadrant Analog Multiplier (19 pages)
2862	HA-2547	Wideband Two Quadrant Analog Multiplier (8 pages)
2901	HA-2548	Precision, High Slew Rate, Wideband Operational Amplifier (10 pages)
2472	HA-2548/883	Precision, High Slew Rate, Wideband Operational Amplifier (14 pages)
2477	HA-2556	Wideband Four Quadrant Voltage Output Analog Multiplier (18 pages)
3619	HA-2556/883	Wideband Four Quadrant Analog Multiplier (Voltage Output) (20 pages)
2478	HA-2557	Wideband Four Quadrant Current Output Analog Multiplier (13 pages)
3638	HA-2557/883	Wideband Four Quadrant Analog Multiplier (Current Output) (14 pages)
2902	HA-2600, HA-2602, HA-2605	Wideband, High Impedance Operational Amplifiers (8 pages)
3700	HA-2600/883, HA-2602/883	Wideband, High Impedance Operational Amplifiers (11 pages)
2903	HA-2620, HA-2622, HA-2625	Very Wideband, Uncompensated Operational Amplifiers (7 pages)
3701	HA-2620/883, HA-2622/883	Very Wideband, High Input Impedance Uncompensated Operational Amplifiers (11 pages)
2904	HA-2640, HA-2645	High Voltage Operational Amplifiers (6 pages)
3702	HA-2640/883	High Voltage Operational Amplifier (11 pages)
3391	HA-2705	Low Power, High Performance Operational Amplifier (3 pages)
2841	HA-2839	Very High Slew Rate Wideband Operational Amplifier (8 pages)
3593	HA-2839/883	Very High Slew Rate, Wideband Operational Amplifier (13 pages)

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2842	HA-2840	Very High Slew Rate Wideband Operational Amplifier (8 pages)
3594	HA-2840/883	Very High Slew Rate, Wideband Operational Amplifier (13 pages)
2843	HA-2841	Wideband, Fast Settling, Unity Gain Stable, Video Operational Amplifier (9 pages)
3621	HA-2841/883	Wideband, Fast Settling, Unity Gain Stable, Video Operational Amplifier (14 pages)
2766	HA-2842	Wideband, High Slew Rate, High Output Current, Video Operational Amplifier (9 pages)
3622	HA-2842/883	Wideband, High Slew Rate, High Output Current, Video Operational Amplifier (14 pages)
2844	HA-2850	Low Power, High Slew Rate Wideband Operational Amplifier (8 pages)
3595	HA-2850/883	Low Power, High Slew Rate, Wideband Operational Amplifier (13 pages)
3680	HA4201	Wideband, 1 x 1 Video Crosspoint Switch with Tally Output (9 pages) FN3680.1
3679	HA4314, HA4314A	Wideband, 4 x 1 Video Crosspoint Switch (10 pages) FN3679.1
3678	HA4404, HA4404A	Wideband, 4 x 1 Video Crosspoint Switch with Tally Outputs (10 pages) FN3678.1
3990	HA4600	Wideband, Video Buffer with Output Disable (9 pages)
2922	HA-4741	Quad Operational Amplifier (6 pages)
3704	HA-4741/883	Quad Operational Amplifier (11 pages)
2855	HA-4900, HA-4902, HA-4905	Precision Quad Comparator (8 pages)
3929	HA-4902/883	Precision Quad Comparator (10 pages)
2921	HA-5002	Monolithic, Wideband, High Slew Rate, High Output Current Buffer (8 pages)
3705	HA-5002/883	Monolithic, Wideband, High Slew Rate, High Output Current Buffer (15 pages)

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2923	HA-5004	100MHz Current Feedback Amplifier (9 pages)
3706	HA-5004/883	100MHz Current Feedback Amplifier (13 pages)
3654	HA5013	Triple 125MHz Video Amplifier (16 pages)
2845	HA-5020	100MHz Current Feedback Video Amplifier (23 pages)
3541	HA-5020/883	100MHz Current Feedback Video Amplifier with Disable (19 pages)
3392	HA5022	Dual, 125MHz Video Current Feedback Amplifier with Disable (18 pages)
3729	HA5022/883	Dual 125MHz Video Current Feedback Amplifier with Disable (22 pages)
3393	HA5023	Dual 125MHz Video Current Feedback Amplifier (16 pages)
3730	HA5023/883	Dual 125MHz Video Current Feedback Amplifier (18 pages)
3550	HA5024	Quad 125MHz Video Current Feedback Amplifier with Disable (18 pages)
3591	HA5025	Quad 125MHz Video Current Feedback Amplifier (16 pages)
2924	HA-5033	Video Buffer (10 pages)
3930	HA-5033/883	Video Buffer (12 pages)
2905	HA-5101, HA-5111	Low Noise, High Performance Operational Amplifiers (10 pages)
3931	HA-5101/883	Low Noise, High Performance Operational Amplifier (13 pages)
2925	HA-5102, HA-5104, HA-5112, HA-5114	Low Noise, High Performance Operational Amplifiers (10 pages)
3709	HA-5102/883	Dual, Low Noise, High Performance Operational Amplifier (13 pages)
3710	HA5104/883	Low Noise, High Performance, Quad Operational Amplifier (13 pages)
3932	HA-5111/883	Low Noise, High Performance Uncompensated Operational Amplifier (13 pages)
3711	HA-5112/883	Dual, Low Noise, High Performance Uncompensated Operational Amplifier (13 pages)

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3712	HA-5114/883	Quad, Low Noise, High Performance Uncompensated Operational Amplifier (13 pages)
2906	HA-5127	Ultra-Low Noise Precision Operational Amplifier (9 pages)
3751	HA-5127/883	Ultra Low Noise, Precision Operational Amplifier (13 pages)
2907	HA-5130, HA-5135	Precision Operational Amplifiers (8 pages)
2926	HA-5134	Precision Quad Operational Amplifier (8 pages)
3713	HA-5134/883	Precision Quad Operational Amplifier (13 pages)
3731	HA-5135/883	Precision Operational Amplifier (13 pages)
2908	HA-5137	Ultra-Low Noise Precision Wideband Operational Amplifier (8 pages)
3714	HA-5137/883	Ultra Low Noise, Precision Wideband Operational Amplifier (13 pages)
2909	HA-5142, HA-5144	Dual/Quad Ultra-Low Power Operational Amplifiers (7 pages)
3732	HA-5142/883	Dual, Ultra Low Power Operational Amplifier (12 pages)
3934	HA-5144/883	Quad, Ultra-Low Power Operational Amplifier (12 pages)
2910	HA-5147	Ultra-Low Noise Precision High Slew Rate Wideband Operational Amplifier (8 pages)
3715	HA-5147/883	Ultra Low Noise, Precision, High Slew Rate Wideband Operational Amplifier (13 pages)
2911	HA-5160, HA-5162	Wideband, JFET Input High Slew Rate, Uncompensated, Operational Amplifiers (8 pages)
2912	HA-5170	Precision JFET Input Operational Amplifier (8 pages)
2913	HA-5177	Ultra-Low Offset Voltage Operational Amplifier (10 pages)
3733	HA-5177/883	Ultra Low Offset Voltage Operational Amplifier (14 pages)
2914	HA-5190, HA-5195	Wideband, Fast Settling Operational Amplifiers (8 pages)
2915	HA-5221, HA-5222	Low Noise, Wideband Precision Operational Amplifier (11 pages)
3716	HA-5221/883	Low Noise, Wideband, Precision Operational Amplifier (12 pages)

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3717	HA-5222/883	Dual, Low Noise, Wideband, Precision Operational Amplifier (15 pages)
2857	HA-5320	High Speed Precision Monolithic Sample and Hold Amplifier (10 pages)
2927	HA-5320/883	High Speed Precision Sample and Hold Amplifier (12 pages)
2858	HA-5330	Very High Speed Precision Monolithic Sample and Hold Amplifier (4 pages)
3935	HA-5330/883	Very High Speed Precision Monolithic Sample and Hold Amplifier (9 pages)
2859	HA-5340	High Speed, Low Distortion, Precision Monolithic Sample and Hold Amplifier (8 pages)
2452	HA-5340/883	High Speed, Low Distortion, Precision Monolithic Sample and Hold Amplifier (12 pages)
3690	HA5351	Fast Acquisition Sample and Hold Amplifier (7 pages)
3727	HA-5351/883	Fast Acquisition, Low Power Sample and Hold Amplifier (1 page)
3394	HA5352	Fast Acquisition Dual Sample and Hold Amplifier (7 pages) FN3394.3
3728	HA-5352/883	Fast Acquisition Dual Sample and Hold Amplifier (1 page)
3389	HA7210	Low Power Crystal Oscillator (15 pages)
2884	HC-5502B	SLIC Subscriber Line Interface Circuit (9 pages)
3588	HC-5504ALC	SLIC Subscriber Line Interface Circuit (9 pages)
2886	HC-5504B	SLIC Subscriber Line Interface Circuit (8 pages)
2443	HC-5504DLC	SLIC Subscriber Line Interface Circuit (8 pages)
3752	HC5506	DSLIC Dual Ringing Subscriber Line Interface Circuit (19 pages) FN3752.1
3567	HC-5509A1	SLIC Subscriber Line Interface Circuit (10 pages)
3675	HC5509A1R 3060	SLIC Subscriber Line Interface Circuit (10 pages)
2799	HC-5509B	SLIC Subscriber Line Interface Circuit (10 pages)

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2798	HC-5524	SLIC Subscriber Line Interface Circuit (9 pages)
2887	HC-5560	PCM Transcoder (9 pages)
2888	HC-55536	Continuous Variable Slope Delta-Demodulator (CVSD) (3 pages)
2889	HC-55564	Continuously Variable Slope Delta-Modulator (CVSD) (6 pages)
3738	HC-55564/883	Continuously Variable Slope Delta-Modulator (CVSD) (14 pages)
2916	HFA-0001	Ultra High Slew Rate Operational Amplifier (10 pages)
2917	HFA-0002	Low Noise Wideband Operational Amplifier (9 pages)
2749	HFA-0003, HFA-0003L	Ultra High Speed Comparator (4 pages)
2918	HFA-0005	High Slew Rate Operational Amplifier (10 pages)
2945	HFA1100, HFA1120	Ultra High-Speed, Current Feedback Amplifiers (12 pages)
3615	HFA1100/883	850MHz Current Feedback Amplifier (16 pages)
3597	HFA1102	Ultra High-Speed, Current Feedback Amplifier with Compensation Pin (8 pages)
3547	HFA1102Y	Ultra High-Speed Current Feedback Amplifier with Compensation Pin (4 pages)
3957	HFA1103	Video Op Amp with High Speed Sync Stripper (6 pages) FN3957
3395	HFA1105	High-Speed, Low Power, Current Feedback Video Operational Amplifier (7 pages)
3922	HFA1106	High Speed, Low Power, Video Operational Amplifier with Compensation Pin (16 pages)
2944	HFA1110	750MHz Low Distortion Unity Gain, Closed Loop Buffer (9 pages)
3620	HFA1110/883	750MHz, Low Distortion Unity Gain, Closed Loop Buffer (15 pages)
2992	HFA1112	Ultra High-Speed Programmable Gain Buffer Amplifier (15 pages)
3610	HFA1112/883	Ultra High Speed Programmable Gain Buffer Amplifier (18 pages)
1342	HFA1113	Output Limiting, Ultra High Speed, Programmable Gain, Buffer Amplifier (19 pages)
3618	HFA1113/883	Output Limiting, Ultra High Speed Programmable Gain, Buffer Amplifier (22 pages)
3151	HFA1114	Ultra High-Speed Programmable Gain Buffer Amplifier (7 pages)
3606	HFA1115	High-Speed, Low Power, Output Limiting, Closed Loop Buffer Amplifier (9 pages)
3724	HFA1115/883	High Speed, Low Power, Output Limiting Closed Loop Buffer Amplifier (5 pages)
3617	HFA1120/883	850MHz Current Feedback Amplifier with Offset Adjust (17 pages)
3369	HFA1130	Output Clamping, Ultra High-Speed Current Feedback Amplifier (11 pages)
3625	HFA1130/883	Output Clamping, 850MHz Current Feedback Amplifier (19 pages)
3653	HFA1135	High-Speed, Low Power, Video Operational Amplifier with Output Limiting (7 pages)
3725	HFA1135/883	High Speed, Low Power Current Feedback Amplifier with Programmable Output Limiting (5 pages)
3955	HFA1145	High-Speed, Low Power, Current Feedback Video Operational Amplifier with Output Disable (15 pages)
3726	HFA1145/883	High Speed, Low Power, Current Feedback Video Operational Amplifier with Output Disable (5 pages)
3605	HFA1205	Dual High-Speed, Low Power, Video Operational Amplifier (9 pages) FN3605.2
3607	HFA1212, HFA1412	Dual/Quad High-Speed, Low Power Closed Loop Buffer Amplifiers (6 pages)
3742	HFA1212/883	Dual, High Speed, Low Power, Video Closed Loop Buffer (5 pages)
3682	HFA1245	Dual, High-Speed, Low Power, Video Operational Amplifier with Disable (8 pages)
3743	HFA1245/883	Dual, High Speed, Low Power, Video Operational Amplifier with Output Disable (6 pages)
3604	HFA1405	Quad High-Speed, Low Power, Video Operational Amplifier (10 pages)

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3744	HFA1412/883	Quad, High Speed, Low Power, Video Closed Loop Buffer (4 pages)
3076	HFA3046, HFA3096, HFA3127, HFA3128	Ultra High Frequency Transistor Array (11 pages) FN3076.5
3663	HFA3101	Gilbert Cell UHF Transistor Array (13 pages) FN3663.1
3635	HFA3102	Dual Long-Tailed Pair Transistor Array (7 pages)
3967	HFA3127/883	Ultra High Frequency Transistor Array (7 pages)
3655	HFA3600	Low-Noise Amplifier/Mixer (16 pages) FN3655.2
2943	HFA5250	Ultra High Speed, Monolithic Pin Driver (5 pages)
3689	HFA5251	Ultra High-Speed Monolithic Pin Driver (10 pages) FN3689.2
2919	ICL7611, ICL7612	ICL76XX Series Low Power CMOS Operational Amplifiers (12 pages)
3403	ICL7621, ICL7641, ICL7642	ICL76XX Series Low Power CMOS Operational Amplifiers (12 pages)
2920	ICL7650S	Super Chopper-Stabilized Operational Amplifier (12 pages)
2863	ICL8013	Four Quadrant Analog Multiplier (8 pages)
2864	ICL8038	Precision Waveform Generator/ Voltage Controlled Oscillator (10 pages)
2865	ICL8048, ICL8049	Log/Antilog Amplifiers (10 pages)
2866	ICM7242	Long Range Fixed Timer (6 pages)
2867	ICM7555, ICM7556	General Purpose Timers (8 pages)
LINEAR APPLICATION NOTES		
9007	AN007	Using the 8048/8049 Log/Antilog Amplifier (6 pages)
9013	AN013	Everything You Always Wanted to Know About the ICL8038 (4 pages)
9040	AN040	Using the ICL8013 Four Quadrant Analog Multiplier (6 pages)
9053	AN053	The ICL7650 A New Era in Glitch-Free Chopper Stabilized Amplifiers (19 pages)
9509	AN509	A Simple Comparator Using the HA-2620 (1 page)
9514	AN514	The HA-2400 PRAM Four Channel Operational Amplifier (7 pages)
9515	AN515	Operational Amplifier Stability: Input Capacitance Considerations (2 pages)
9519	AN519	Operational Amplifier Noise Prediction (4 pages)
9525	AN525	HA-5190/5195 Fast Settling Operational Amplifier (4 pages)
9526	AN526	Video Applications for the HA-5190/ 5195 (5 pages)
9540	AN540	HA-5170 Precision Low Noise JFET Input Operational Amplifier (4 pages)
9541	AN541	Using HA-2539 or HA-2540 Very High Slew Rate, Wideband Operational Amplifiers (4 pages)
9543	AN543	New High Speed Switch Offers Sub-50ns Switching Times (7 pages)
9544	AN544	Micropower Op Amp Family HA-5141/42/44 and HA-5151/52/54 (6 pages)
9546	AN546	A Method of Calculating HA-2625 Gain Bandwidth Product vs. Temperature (4 pages)
9548	AN548	A Designers Guide for the HA-5033 Video Buffer (12 pages)
9549	AN549	The HC-550X Telephone Subscriber Line Interface Circuits (19 pages)
9550	AN550	Using the HA-2541 (6 pages)
9551	AN551	Recommended Test Procedures for Operational Amplifiers (6 pages)
9552	AN552	Using the HA-2542 (5 pages)
9553	AN553	HA-5147/37/27, Ultra Low Noise Amplifiers (8 pages)
9554	AN554	Low Noise Family HA-5101/02/04/ 11/12/14 (7 pages)
9556	AN556	Thermal Safe-Operating-Areas for High Current Op Amps (5 pages)
9571	AN571	Using Ring Sync with HC-5502A and HC-5504 SLICs (2 pages)
9573	AN573	The HC-5560 Digital Line Transcoder (6 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
95290	AN5290	Integrated-Circuit Operational Amplifiers (20 pages)
96048	AN6048	Some Applications of A Programmable Power Switch/Amp (12 pages)
96077	AN6077	An IC Operational Transconductance-Amplifier (OTA) With Power Capability (12 pages)
96182	AN6182	Features and Applications of Integrated Circuit Zero-Voltage Switches (CA3058, CA3059 and CA3079) (31 pages)
96386	AN6386	Understanding and Using the CA3130, CA3130A and CA3130B BiMOS Operational Amplifiers (5 pages)
96459	AN6459	Why Use the CMOS Operational Amplifiers and How to Use it (4 pages)
96669	AN6669	FET-Bipolar Monolithic Op Amps Mate Directly to Sensitive Sources (3 pages)
96915	AN6915	Application of CA1524 Series Pulse-Width Modulator ICs (18 pages)
97326	AN7326	Applications of the CA3228E Speed Control System (16 pages)
98707	AN8707	The CA3450: A Single-Chip Video Line Driver and High Speed Op Amp (14 pages)
98742	AN8742	Application of the CD22402 Video Sync Generator (4 pages)
98743	AN8743	Micropower Crystal-Controlled Oscillator Design Using CMOS Inverters (8 pages)
98811	AN8811	BiMOS-E Process Enhances the CA5470 Quad Op Amp (8 pages)
98823	AN8823	CMOS Phase-Locked-Loop Applications Using the CD54/74HC/HCT4046A and CD54/74HC/HCT7046A (23 pages)
99202	AN9202	Using the HFA1100, HFA1130 Evaluation Fixture (4 pages)
99305	AN9305	HA5020 Operational Amplifier Feedback Resistor Selection (2 pages)
99314	AN9314	Harris UHF Pin Drivers (4 pages)
99315	AN9315	RF Amplifier Design Using HFA3046/3096/3127/3128 Transistor Arrays (4 pages)
99317	AN9317	Micropower Clock Oscillator and Op Amps Provide System Control for Battery Operated Circuits (2 pages)
99327	AN9327	HC-5509A1 Ring Trip Component Selection (9 pages)
99334	AN9334	Improving Start-Up Time at 32kHz for the HA7210 Low Power Crystal Oscillator (2 pages)
99415	AN9415	Feedback, Op Amps and Compensation (12 pages)
99420	AN9420	Current Feedback Amplifier Theory and Applications (7 pages) AN9420.1
99502	AN9502	Oscillator Produces Quadrature Waves (2 pages)
99503	AN9503	Low Output Impedance MUX (1 pages)
99507	AN9507	Video Cable Drivers Save Board Space, Increase Bandwidth (2 pages)
9508	AN9508	Video Multiplexer Delivers Lower Signal Degradation HIP4081, 80V High Frequency H-Bridge Driver (1 pages)
99510	AN9510	Basic Analog for Digital Designers (6 pages) AN9510
99513	AN9513	Component Video Sync Formats (HFA1103) (3 pages) AN9513
LINEAR SPICE MACRO-MODELS		
660001	MM0001	HFA-0001 Spice Operational Amplifier Macro-Model (4 pages)
660002	MM0002	HFA-0002 Spice Operational Amplifier Macro-Model (4 pages)
660005	MM0005	HFA-0005 Spice Operational Amplifier Marco-Model (4 pages)
662500	MM2500	HA2500/02 Spice Operational Amplifier Macro-Model (5 pages)
662510	MM2510	HA-2510/12 Spice Operational Amplifier Macro-Model (4 pages)
662520	MM2520	HA-2520/22 Spice Operational Amplifier Macro-Model (4 pages)
662539	MM2539	HA-2539 Spice Operational Amplifier Macro-Model (4 pages)
662540	MM2540	HA-2540 Spice Operational Amplifier Macro-Model (4 pages)
662541	MM2541	HA-2541 Spice Operational Amplifier Macro-Model (5 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
662542	MM2542	HA-2542 Spice Operational Amplifier Macro-Model (5 pages)
662544	MM2544	HA-2544 Spice Operational Amplifier Macro-Model (5 pages)
662548	MM2548	HA-2548 Spice Operational Amplifier Macro-Model (5 pages)
662600	MM2600	HA-2600/02 Spice Operational Amplifier Macro-Model (5 pages)
662620	MM2620	HA-2620/22 Spice Operational Amplifier Macro-Model (5 pages)
662839	MM2839	HA-2839 Spice Operational Amplifier Macro-Model (4 pages)
662840	MM2840	HA-2840 Spice Operational Amplifier Macro-Model (4 pages)
662841	MM2841	HA-2841 Spice Operational Amplifier Macro-Model (4 pages)
662842	MM2842	HA-2842 Spice Operational Amplifier Macro-Model (4 pages)
662850	MM2850	HA-2850 Spice Operational Amplifier Macro-Model (4 pages)
663046	MM3046	HFA3046/3096/3127/3128 Transistor Array Spice Models (4 pages)
665002	MM5002	HA-5002 Spice Buffer Amplifier Macro-Model (4 pages)
665004	MM5004	HA-5004 Spice Current Feedback Amplifier Macro-Model (4 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
665020	MM5020	HA-5020 Spice Current Feedback Operational Amplifier Macro-Model (4 pages)
665033	MM5033	HA-5033 Spice Buffer Amplifier Macro-Model (4 pages)
665101	MM5101	HA-5101 Spice Operational Amplifier Macro-Model (5 pages)
665102	MM5102	HA-5102 Spice Operational Amplifier Macro-Model (5 pages)
665104	MM5104	HA-5104 Spice Operational Amplifier Macro-Model (5 pages)
665112	MM5112	HA-5112 Spice Operational Amplifier Macro-Model (5 pages)
665114	MM5114	HA-5114 Spice Operational Amplifier Macro-Model (5 pages)
665127	MM5127	HA-5127 Spice Operational Amplifier Macro-Model (4 pages)
665137	MM5137	HA-5137 Spice Operational Amplifier Macro-Model (4 pages)
665147	MM5147	HA-5147 Spice Operational Amplifier Macro-Model (4 pages)
665190	MM5190	HA-5190 Spice Operational Amplifier Macro-Model (4 pages)
665221	MM5221	HA-5221/22 Spice Operational Amplifier Macro-Model (4 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
27007	BR007	Complete Listing of Harris Sales Offices, Representatives and Authorized Distributors World Wide (7 pages)
7031	-	Harris Semiconductor Part Number Nomenclature Guide (16 pages)
LOGIC PACKAGING INFORMATION		
7020	SG103 Section 7	Logic Packaging Information (15 pages)
CD4000B SERIES LOGIC DATA SHEETS		
7012	CMOS Logic ICs - CD4000B Series	Harris' High-Reliability CD4000B Series of high- voltage CMOS ICs consists of a broad range of SSI, MSI-1, and MSI-2 (LSI) functions from simple gates to complex counters, registers, and arithmetic circuits. (38 pages)
CD4000 SERIES LOGIC DATA SHEETS		
985	CD4001B, CD4002B, CD4025B Types	CMOS NOR Gates (4 pages)
945	CD4001UB Types	CMOS Quad 2-Input NOR Gate (3 pages)
1033	CD4006B Types	CMOS 18-Stage Static Shift Register (4 pages)
977	CD4007UB Types	CMOS Dual Complementary Pair Plus Inverter (4 pages)
951	CD4008B Types	CMOS 4-Bit Full Adder (4 pages)
940	CD4009UB, CD4010B Types	CMOS Hex Buffers/Converters (4 pages)
3718	CD4011B, CD4012B, CD4023B Types	CMOS NAND Gates (4 pages)
947	CD4011UB Types	CMOS Quad 2-Input NAND Gate (3 pages)
936	CD4013B Types	CMOS Dual 'D'-Type Flip-Flop (4 pages)
1043	CD4014B, CD4021B Types	CMOS 8-Stage Static Shift Registers (5 pages)
1024	CD4015B Types	CMOS Dual 4-Stage Static Shift Register (4 pages)
953	CD4016B Types	CMOS Quad Bilateral Switch (5 pages)
1113	CD4017B, CD4022B Types	CMOS Counter/Dividers (6 pages)
1034	CD4018B Types	CMOS Presettable Divide-By-"N" Counter (5 pages)
1045	CD4019B Types	CMOS Quad AND/OR Select Gate (4 pages)
1063	CD4020B, CD4024B, CD4040B Types	CMOS Ripple-Carry Binary Counter/Dividers (4 pages)
1118	CD4026B, CD4033B Types	CMOS Decade Counters/ Dividers (6 pages)
942	CD4027B Types	CMOS Dual J-K Master-Slave Flip-Flop (4 pages)
1016	CD4028B Types	BCD-to-Decimal Decoder (4 pages)
1028	CD4029B Types	CMOS Presettable Up/Down Counter (6 pages)
1055	CD4030B Types	CMOS Quad Exclusive-OR Gate (3 pages)
1073	CD4031B Types	CMOS 64-Stage Static Shift Register (5 pages)
1062	CD4034B Types	CMOS 8-Stage Static Bidirectional Parallel/Serial Input/Output Bus Register (6 pages)
1101	CD4035B Types	CMOS 4-Stage Parallel In/ Parallel Out Shift Register (5 pages)
934	CD4041UB Types	CMOS Quad True/ Complement Buffer (3 pages)
954	CD4042B Types	CMOS Quad Clocked "D" Latch (4 pages)
956	CD4043B, CD4044B Types	CMOS Quad 3-State R/S Latches (4 pages)
1119	CD4045B Types	CMOS 21-Stage Counter (4 pages)
1099	CD4046B Types	CMOS Micropower Phase-Locked Loop (6 pages)
1123	CD4047B Types	CMOS Low-Power Monostable/Astable Multivibrator (7 pages)
1124	CD4048B Types	CMOS Multifunction Expandable 8-Input Gate (5 pages)
926	CD4049UB, CD4050B Types	CMOS Hex Buffer/Converters (4 pages)
902	CD4051B, CD4052B, CD4053B Types	CMOS Analog Miltiplexers/ Demultiplexers (7 pages)
634	CD4054B, CD4055B, CD4056B Types	CMOS Liquid-Crystal Display Drivers (5 pages)
898	CD4059A Types	CMOS Programmable Divide-by-"N" Counter (8 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
1120	CD4060B Types	CMOS 14-Stage Ripple-Carry Binary Counter/Divider and Oscillator (4 pages)
805	CD4063B Types	CMOS 4-Bit Magnitude Comparator (4 pages)
1114	CD4066B Types	CMOS Quad Bilateral Switch (5 pages)
3719	CD4067B, CD4097B Types	CMOS Analog Multiplexers/ Demultiplexers (6 pages)
809	CD4068B Types	CMOS 8-Input NAND/AND Gate (3 pages)
804	CD4069UB Types	CMOS Hex Inverter (3 pages)
910	CD4070B, CD4077B Types	CMOS Quad Exclusive-OR and Exlusive-NOR Gates (3 pages)
807	CD4071B, CD4072B, CD4075B Types	CMOS or Gates (4 pages)
806	CD4073B, CD4081B, CD4082B Types	CMOS AND Gates (4 pages)
903	CD4076B Types	CMOS 4-Bit D-Type Registers (4 pages)
810	CD4078B Types	CMOS 8-Input NOR/OR Gate (3 pages)
811	CD4085B Types	CMOS Dual 2-Wide 2-Input AND-OR-INVERT Gate (4 pages)
812	CD4086B Types	CMOS Expandable 4-Wide 2-Input AND-OR-INVERT Gate (4 pages)
1003	CD4089B Types	CMOS Binary Rate Multiplier (5 pages)
836	CD4093B Types	CMOS Quad 2-Input NAND Schmitt Triggers (4 pages)
3707	CD4094B Types	CMOS 8-Stage Shift-and-Store Bus Register (4 pages)
879	CD4095B, CD4096B Types	CMOS Gated J-K Master-Slave Flip-Flops (4 pages)
979	CD4098B Types	CMOS Dual Monostable Multivibrator (5 pages)
948	CD4099B Types	CMOS 8-Bit Addressable Latch (4 pages)
1002	CD4502B Types	CMOS Strobed Hex Inverter/ Buffer (3 pages)
1224	CD4503B Types	CMOS Hex Buffer (3 pages)
1846	CD4504B Types	CMOS Hex Voltage-Level Shifter for TTL-to-CMOS or CMOS-to-CMOS Operation (4 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
1009	CD4508B Types	CMOS Dual 4-Bit Latch (4 pages)
899	CD4510B, CD4516B Types	CMOS Presettable Up/Down Counters (6 pages)
901	CD4511B Types	CMOS BCD-to-7-Segment Latch Decoder Drivers (5 pages)
1032	CD4512B Types	CMOS 8-Channel Data Selector (3 pages)
3721	CD4514B, CD4515B Types	CMOS 4-Bit Latch/4-to-16 Line Decoders (4 pages)
1148	CD4517B Types	CMOS Dual 64-Stage Static Shift Register (5 pages)
808	CD4518B, CD4520B Types	CMOS Dual Up-Counters (5 pages)
1723	CD4519B Types	CMOS 4-Bit AND/OR Selector, Quad 2-Channel Data Selector, or Quad Exclusive NOR Gate (5 pages)
1735	CD4521B Types	CMOS 24-Stage Frequency Drivider (7 pages)
1710	CD4522B Types	CMOS Programmable BCD Divide-by-"N" Counter (7 pages)
1006	CD4527B Types	CMOS BCD Rate Multiplier (5 pages)
1720	CD4529B Types	CMOS Dual 4-Channel Analog Data Selector (6 pages)
876	CD4532B Types	CMOS 8-Bit Priority Encoder (4 pages)
1186	CD4536B Types	CMOS Programmable Timer High-Voltage Types (20V Rating) (8 pages)
1245	CD4538B Types	CMOS Dual Precision Monostable Multivibrator (1 pages) Obsolete - See Part Number CD14538B, AnswerFAX Document Number 3737
1378	CD4541B Types	CMOS Programmable Timer High-Voltage Types (20V Rating) (4 pages)
1327	CD4543B Types	CMOS BCD-to-Seven-Segment Latch/Decoder/ Driver for Liquid-Crystal Displays (6 pages)
858	CD4555B, CD4556B Types	CMOS Dual Binary to 1 of 4 Decoder/Demultiplexers (5 pages)
1711	CD4560B Types	CMOS NBCD Adder (5 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
1728	CD4566B Types	CMOS Industrial Timer-Base Generator High-Voltage Types (20V Rating) (6 pages)
1704	CD4572UB Types	CMOS Hex Gate (5 pages)
1146	CD4585B Types	CMOS 4-Bit Magnitude Comparator (4 pages)
1111	CD4724B	CMOS 8-Bit Addressable Latch (4 pages)
1725	CD7211, CD7211A Types	CMOS Four-Digit LCD Decoders-Drivers (5 pages)
1726	CD7211M, CD7211AM Types	CMOS Four-Digit LCD Decoders-Drivers (5 pages)
3737	CD14538B Types	CMOS Dual Precision Monostable Multivibrator (7 pages)
1686	CD22402	Sync Generator for TV Applications and Video Processing Systems (10 pages)
1869	CD22777 Types	CMOS 32kHz Quartz Analog Clock Circuit (4 pages)
980	CD40100B Types	CMOS 32-Stage Static Left/ Right Shift Register (5 pages)
984	CD40102B, CD40103B Types	CMOS 8-Stage Presettable Synchronous Down Counters (7 pages)
1044	CD40105B Types	CMOS FIFO Register (5 pages)
1017	CD40106B Types	CMOS Hex Schmitt Triggers (4 pages)
1015	CD40107B	CMOS Dual 2-Input NAND Buffer/Driver (3 pages)
3722	CD40109B Types	CMOS Quad Low-to-High Voltage Level Shifter (4 pages)
1125	CD40110B Types	CMOS Decade Up-Down Counter/Latch/Display Driver (9 pages)
1234	CD40116 Types	CMOS High-Speed 8-Bit Bidirectional CMOS/TTL Interface Level Converter (6 pages)
1333	CD40117B Types	Programmable Dual 4-Bit Terminator (4 pages)
1117	CD40147B Types	10-Line to 4-Line BCD Priority Encoder (3 pages)
1047	CD40160B, CD40161B, CD40163B Types	CMOS Synchronous PRogrammable 4-Bit Counters (7 pages)
1031	CD40174B Types	CMOS Hex 'D'-Type Flip-Flop (4 pages)
1326	CD40175B Types	CMOS Quad 'D'-Type Flip-Flop (6 pages)
993	CD40192B, CD40193B Types	CMOS Presettable Up/Down Counters (Dual Clock with Reset) (5 pages)
1220	CD40194B	CMOS 4-Bit Bidirectional Universal Shift Register (6 pages)
982	CD40257B	CMOS Quad 2-Line-to-1-Line Data Selector/Multiplexer (3 pages)
CD54/74 AC/ACT COMMERCIAL LOGIC DATA SHEETS		
1855	CD54/74AC00, CD54/74ACT00	Quad 2-Input NAND Gate (4 pages)
1978	CD54/74AC02, CD54/74ACT02	Quad 2-Input NOR Gate (4 pages)
1945	CD54/74AC04, CD54/74AC05, CD54/74ACT04, CD54/74ACT05	Hex Inverters (4 pages)
1950	CD54/74AC08, CD54/74ACT08	Quad 2-Input AND Gate (4 pages)
1977	CD54/74AC10, CD54/74ACT10	Triple 3-Input NAND Gate (5 pages)
1984	CD54/74AC14, CD54/74ACT14	Hex Inverting Schmitt Trigger (5 pages)
1976	CD54/74AC20, CD54/74ACT20	Dual 4-Input NAND Gate (5 pages)
1951	CD54/74AC32, CD54/74ACT32	Quad 2-Input OR Gate (4 pages)
1881	CD54/74AC74, CD54/74ACT74	Dual D-Type Flip-Flop with Set and Reset Positive-Edge-Triggered (6 pages)
1952	CD54/74AC86, CD54/74ACT86	Qual 2-Input Exclusive-OR Gate (4 pages)
1967	CD54/74AC109, CD54/74AC112, CD54/74ACT109, CD54/74ACT112	Dual "J-K" Flip-Flop With Set and Reset (7 pages)
1909	CD54/74AC138, CD54/74AC238, CD54/74ACT138, CD54/74ACT238	3-to-8-Line Decoders/ Demultiplexers AC/ACT138 - Inverting AC/ACT238 - Non-Inverting (6 pages)
1953	CD54/74AC139, CD54/74ACT139	Dual 2-to-4-Line Decoder/ Demultiplexer (5 pages)
1980	CD54/74AC151, CD54/74ACT151	8-Input Multiplexer (6 pages)
1966	CD54/74AC153, CD54/74ACT153	Dual 4-Input Multiplexer (6 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
1910	CD54/74AC157, CD54/74AC158, CD54/ACT157, CD54/74ACT158	Quad 2-Input Multiplexers (6 pages)
1959	CD54/74AC161, CD54/74AC163, CD54/74ACT161, CD54/74ACT163	Synchronous Presettable Binary Counters (9 pages)
1954	CD54/74AC164, CD54/74ACT164	8-Bit Serial-In/Parallel-Out Shift Register (6 pages)
1973	CD54/74AC174, CD54/74ACT174	Hex D Flip-Flop with Reset (6 pages)
1964	CD54/74AC175, CD54/74ACT175	Quad D Flip-Flop with Reset (6 pages)
1911	CD54/74AC191, CD54/74ACT191	Presettable Synchronous 4-Bit Binary Up/Down Counter (9 pages)
1947	CD54/74AC193, CD54/74ACT193	Presettable Synchronous 4-Bit Binary Up/Down Counter with Reset (9 pages)
1856	CD54/74AC240, CD54/74AC241, CD54/74AC244, CD54/74ACT240, CD54/74ACT241, CD54/74ACT244	Octal Buffer/Line Drivers, 3-State (6 pages)
1907	CD54/74AC245, CD54/74ACT245	Octal-Bus Tranceiver, 3-State, Non-Inverting (6 pages)
1981	CD54/74AC251, CD54/74ACT251	8-Input Multiplexer, 3-State (6 pages)
1985	CD54/74AC253, CD54/74ACT253	Dual 4-Input Multiplexer, 3-State (6 pages)
1955	CD54/74AC257, CD54/74AC258, CD54/74ACT257, CD54/74ACT258	Qual 2-Input Multiplexer with 3-State Outputs (6 pages)
1979	CD54/74AC273, CD54/74ACT273	Octal D Flip-Flop with Reset (6 pages)
1957	CD54/74AC280, CD54/74ACT280	9-Bit Odd/Even Parity Generator/Checker (4 pages)
1912	CD54/74AC283, CD54/74ACT283	4-Bit Binary Full Adder with Fast Carry (4 pages)
2195	CD54/74AC297, CD54/74ACT297	Digital Phase-Locked Group (7 pages)
1958	CD54/74AC299, CD54/74AC323, CD54/74ACT299, CD54/74ACT323	8-Input Universal Shift/Storage Register with Common Parallel I/O Pins (9 pages)
1882	CD54/74AC373, CD54/74AC533, CD54/74ACT373, CD54/74ACT533	Octal Transparent Latch, 3-State (7 pages)
1883	CD54/74AC374, CD54/74AC534, CD54/74ACT374, CD54/74ACT534	Octal D-Type Flip-Flops, 3-State Positive-Edge Triggered (7 pages)
1857	CD54/74AC540, CD54/74AC541, CD54/74ACT540, CD54/74ACT541	Octal Buffer/Line Drivers, 3-State (6 pages)
1956	CD54/74AC563, CD54/74AC573, CD54/74ACT563, CD54/74ACT573	Octal Transparent Latch, 3-State (7 pages)
1948	CD54/74AC564, CD54/74AC574, CD54/74ACT564, CD54/74ACT574	Octal D-Type Flip-Flop, 3-State Positive-Edge-Triggered (7 pages)
1968	CD54/74AC623, CD54/74ACT623	Octal-Bus Transceiver, 3-State, Non-Inverting (6 pages)
1970	CD54/74AC646, CD54/74AC648, CD54/74ACT646, CD54/74ACT648	Octal-Bus Transceiver/ Registers, 3-State (7 pages)
1982	CD54/74AC647, CD54/74ACT647	Octal-Bus Transceiver/ Registers, with Open Drain Non-Inverting (7 pages)
1974	CD54/74AC651, CD54/74AC652, CD54/74ACT651, CD54/74ACT652	Octal-Bus Transceiver/ Registers, 3-State (7 pages)
1975	CD54/74AC653, CD54/74AC654, CD54/74ACT653, CD54/74ACT654	Octal-Bus Transceivers/ Registers, Open-Drain (A Side), 3-State (B Side) (8 pages)
2062	CD54/74AC7060, CD54/74AC7061, CD54/74ACT7060, CD54/74ACT7061	14-Stage Binary Counter with Oscillator (6 pages)
1969	CD54/74AC7623, CD54/74ACT7623	Octal-Bus Transceiver, 3-State (B Side), Open Drain (A Side), Non-Inverting (6 pages)
CD54 AC/ACT HI-REL LOGIC DATA SHEETS		
3876	CD54AC00/3A, CD54ACT00/3A	Quad 2-Input NAND Gate (1 pages)
3877	CD54AC02/3A, CD54ACT02/3A	Quad 2-Input NOR Gate (1 pages)
3878	CD54AC04/3A, CD54ACT04/3A	Hex Inverters, Active Outputs (1 pages)
3879	CD54AC05/3A, CD54ACT05/3A	Hex Inverters, Open-Drain Outputs (1 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
3880	CD54AC08/3A, CD54ACT08/3A	Quad 2-Input AND Gate (1 pages)
3881	CD54ACT20/3A	Dual 4-Input NAND Gate (1 pages)
3882	CD54AC32/3A, CD54ACT32/3A	Quad 2-Input OR Gate (1 pages)
3883	CD54AC74/3A, CD54ACT74/3A	Dual D-Type Flip-Flop with Set and Reset (1 pages)
3884	CD54ACT86/3A	Quad 2-Input Exclusive-OR Gate (1 pages)
3885	CD54AC109/3A, CD54ACT109/3A	Dual "J-K" Flip-Flop with Set and Reset (1 pages)
3886	CD54AC112/3A, CD54ACT112/3A	Dual "J-K" Flip-Flop with Set and Reset (1 pages)
3887	CD54AC138/3A, CD54ACT138/3A	3-to-8-Line Decoder/Demultiplexer Inverting (1 pages)
3888	CD54AC139/3A, CD54ACT139/3A	Dual 2-to-4-Line Decoder/ Demultiplexer (1 pages)
3889	CD54ACT151/3A	8-Input Multiplexer (1 pages)
3890	CD54AC153/3A, CD54ACT153/3A	Dual 4-Input Multiplexer (1 pages)
3891	CD54AC157/3A	Quad 2-Input Multiplexer Non-Inverting (1 pages)
3892	CD54AC161/3A, CD54ACT161/3A	Synchronous Presettable Binary Counters (1 pages)
3893	CD54AC163/3A, CD54ACT163/3A	Synchronous Presettable Binary Counters (1 pages)
3894	CD54AC164/3A, CD54ACT164/3A	8-Bit Serial-In/Parallel-Out Shift Registers (1 pages)
3895	CD54ACT174/3A	Hex D Flip-Flop with Reset (1 pages)
3896	CD54AC191/3A, CD54ACT191/3A	Presettable Synchronous 4-Bit Binary Up/Down Counters (1 pages)
3897	CD54AC193/3A, CD54ACT193/3A	Presettable Synchronous 4-Bit Binary Up/Down Counter with Reset (1 pages)
3898	CD54AC240/3A, CD54ACT240/3A	Octal Buffer/Line Driver Three-State, Inverting (1 pages)
3899	CD54ACT241/3A	Octal-Buffer/Line Driver, Three-State (1 pages)
3900	CD54AC244/3A, CD54ACT244/3A	Octal Buffer/Line Driver Three-State, Non-Inverting (1 pages)
3901	CD54AC245/3A, CD54ACT245/3A	Octal-Bus Transceiver Three-State, Non-Inverting (1 pages)
3902	CD54ACT253/3A	Dual 4-Input Multiplexer, Three-State (1 pages)
3903	CD54AC257/3A, CD54ACT257/3A	Quad 2-Input Multiplexer Three-State, Non-Inverting (1 pages)
3904	CD54AC273/3A, CD54ACT273/3A	Octal D Flip-Flop with Reset (1 pages)
3905	CD54AC280/3A, CD54ACT280/3A	9-Bit Odd/Even Parity Generator/Checker (1 pages)
3906	CD54AC283/3A, CD54ACT283/3A	4-Bit Binary Full Adder with Fast Carry (1 pages)
3907	CD54AC299/3A, CD54ACT299/3A	8-Input Universal Shift/Storage Registers with Common Parallel I/O Pins (2 pages)
3908	CD54ACT323/3A	8-Input Universal Shift/Storage Register with Common Parallel I/O Pins (2 pages)
3909	CD54AC373/3A, CD54ACT373/3A	Octal Transparent Latch Three-State, Non-Inverting (1 pages)
3910	CD54AC374/3A, CD54ACT374/3A	Octal D-Type Flip-Flop, Three-State Positive-Edge Triggered, Non-Inverting (1 pages)
3911	CD54ACT533/3A	Octal Transparent Latch, Three-State, Inverting (1 pages)
3912	CD54AC534/3A, CD54ACT534/3A	Octal D-Type Flip-Flop, Three-State Positive-Edge Triggered, Inverting (1 pages)
3913	CD54ACT540/3A	Octal Buffer/Line Driver, Three-State, Inverting (1 pages)
3914	CD54AC541/3A, CD54ACT541/3A	Octal Buffer/Line Driver Three-State, Non-Inverting (1 pages)
3915	CD54AC573/3A, CD54ACT573/3A	Octal Transparent Latch Three-State, Non-Inverting (1 pages)
3916	CD54AC574/3A, CD54ACT574/3A	Octal D-Type Flip-Flop, Three-State Positive-Edge Triggered, Non-Inverting (1 pages)
3917	CD54ACT623/3A	Octal Bus Transceiver Three-State, Non-Inverting (1 pages)
CD54/74 FCT LOGIC DATA SHEETS		
2227	CD54/74FCT240, CD54/74FCT240AT, CD54/74FCT241, CD54/74FCT244, CD54/74FCT244AT	Octal Buffers/Line Drivers, 3-State (5 pages)
2301	CD54/74FCT245, CD5474FCT245AT	Octal-Bus Transceiver, 3-State, Non-Inverting (5 pages)
2303	CD54/74FCT273	Octal D Flip-Flop with Reset (4 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
2230	CD54/74FCT373, CD54/74FCT373AT, CD54/74FCT533	Octal Transparent Latch, 3-State (5 pages)
2305	CD54/74FCT374, CD54/74FCT374AT	Octal D-Type Flip-Flops, 3-State Positive-Edge Triggered (5 pages)
2383	CD54/74FCT540, CD54/74FCT541	Octal Buffers/Line Drivers, 3-State (5 pages)
2399	CD54/74FCT543	Octal Register-Transceivers, 3-State (5 pages)
2295	CD54/74FCT564, CD54/74FCT574, CD54/74FCT574AT	Octal D-Type Flip-Flops, 3-State Positive-Edge Triggered(5 pages)
2304	CD54/74FCT573, CD54/74FCT573AT	Octal Transparent Latch, 3-State (5 pages)
2302	CD54/74FCT623	Octal Bus Transceiver, 3-State, Non-Inverting (5 pages)
2393	CD54/74FCT646, CD54/74FCT646AT	Octal Bus Transceivers/ Registers, 3-State (5 pages)
2394	CD54/74FCT651, CD54/74FCT652	Octal Bus Transceivers/ Registers, 3-State (5 pages)
2403	CD54/74FCT653, CD54/74FCT654	Octal Bus Transceivers/ Registers, Open-Drain (A Side), 3-State (B Side) (6 pages)
2390	CD54/74FCT821A, CD54/74FCT822A	10-Bit D-Type Flip-Flops, 3-State, Positive-Edge Triggered (5 pages)
2389	CD54/74FCT823A, CD54/74FCT824A	9-Bit D-Type Flip-Flops, 3-State, Positive-Edge-Triggered (5 pages)
2397	CD54/74FCT841A, CD54/74FCT842A	10-Bit Transparent Latch, 3-State (5 pages)
2396	CD54/74FCT843A, CD54/74FCT844A	9-Bit Transparent Latch, 3-State (5 pages)
2392	CD54/74FCT861A	10-Bit Bus Transceivers, 3-State (5 pages)
2391	CD54/74FCT863A	9-Bit Bus Transceivers, 3-State (5 pages)
2400	CD54/74FCT2952A	Octal Register-Transceivers, 3-State (5 pages)
2358	CD54/74FCT7623	Octal Bus Transceiver, 3-State, (B Side), Open-Drain (A Side), Non-Inverting (5 pages)
2196	CD54/74FCT7651	Octal Bus Transceiver/Register, 3-State, Inverting (1 pages) Obsolete - See Part Number CD74ACT651, AnswerFAX Document Number 1974

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
CD54/74 HC/HCT COMMERCIAL LOGIC DATA SHEETS		
1464	CD54/74HC00, CD54/74HCT00	High-Speed CMOS Logic, Quad 2-Input NAND Gate (4 pages)
1647	CD54/74HC02, CD54/74HCT02	High-Speed CMOS Logic, Quad 2-Input NOR Gate (4 pages)
1832	CD54/74HC03, CD54/74HCT03	High-Speed CMOS Logic, Quad 2-Input NAND Gate with Open Drain (4 pages)
1471	CD54/74HC04, CD54/74HCT04	High-Speed CMOS Logic, Hex Inverter (4 pages)
1549	CD54/74HC08, CD54/74HCT08	High-Speed CMOS Logic, Quad 2-Input AND Gate (4 pages)
1551	CD54/74HC10, CD54/74HCT10	High-Speed CMOS Logic, Triple 3-Input NAND Gate (4 pages)
1475	CD54/74HC11, CD54/74HCT11	High-Speed CMOS Logic, Triple 3-Input AND Gate (4 pages)
1781	CD54/74HC14, CD54/74HCT14	High-Speed CMOS Logic, Hex Inverting Schmitt Trigger (4 pages)
1601	CD54/74HC20, CD54/74HCT20	High-Speed CMOS Logic, Dual 4-Input NAND Gate (4 pages)
1782	CD54/74HC21, CD54/74HCT21	High-Speed CMOS Logic, Dual 4-Input AND Gate (4 pages)
1648	CD54/74HC27, CD54/74HCT27	Triple 3-Input NOR Gate (4 pages)
1652	CD54/74HC30, CD54/74HCT30	High-Speed CMOS Logic, 8-Input NAND Gate (4 pages)
1643	CD54/74HC32, CD54/74HCT32	High-Speed CMOS Logic, Quad 2-Input OR Gate (4 pages)
1689	CD54/74HC42, CD54/74HCT42	High-Speed CMOS Logic, BCD to Decimal Decoder (1-of-10) (4 pages)
1721	CD54/74HC73, CD54/74HCT73	Dual J-K Flip-Flop with Reset Negative-Edge Trigger (5 pages)
1476	CD54/74HC74, CD54/74HCT74	High-Speed CMOS Logic, Dual D Flip-Flop with Set and Reset Positive-Edge Trigger (5 pages)
1666	CD54/74HC75, CD54/74HCT75	Dual 2-Bit Bistable Transparent Latch (5 pages)
1770	CD54/74HC85, CD54/74HCT85	High-Speed CMOS Logic, 4-Bit Magnitude Comparator (6 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
1644	CD54/74HC86, CD54/74HCT86	High-Speed CMOS Logic, Quad 2-Input EXCLUSIVE - OR Gate (4 pages)
1849	CD54/74HC93, CD54/74HCT93	High-Speed CMOS Logic, 4-Bit Binary Ripple Counter (5 pages)
1722	CD54/74HC107, CD54/74HCT107	High-Speed CMOS Logic, Dual J-K Flip-Flop with Reset (5 pages)
1667	CD54/74HC109, CD54/74HCT109	High-Speed CMOS Logic, Dual J-K Flip-Flop with Set and Reset (5 pages)
1843	CD54/74HC112, CD54/74HCT112	High Speed CMOS Logic, Dual J-K Flip-Flop with Set and Reset (5 pages)
1708	CD54/74HC123, CD54/74HCT123, CD54/74HC423, CD54/74HCT423	High-Speed CMOS Logic, Dual Retriggerable Monostable Multivibrators with Resets (6 pages)
1771	CD54/74HC125, CD54/74HCT125	High-Speed CMOS Logic, Quad Buffer; 3-State (5 pages)
1772	CD54/74HC126, CD54/74HCT126	High-Speed CMOS Logic, Quad Buffer; 3-State (5 pages)
1649	CD54/74HC132, CD54/74HCT132	High-Speed CMOS Logic, Quad 2-Input NAND Schmitt Trigger (4 pages)
1886	CD54/74HC137, CD54/74HCT137, CD54/74HC237, CD54/74HCT237	High-Speed CMOS Logic, 3-to-8 Line Decoder/ Demultiplexer with Address Latches (8 pages)
1477	CD54/74HC138, CD54/74HCT138, CD54/74HC238, CD54/74HCT238	High-Speed CMOS Logic, 3-to-8 Line Decoder/Demultiplexer Inverting and Non-Inverting (5 pages)
1545	CD54/74HC139, CD54/74HCT139	High-Speed CMOS Logic, Dual 2-to-4 Line Decoder/ Demultiplexer (5 pages)
1773	CD54/74HC147, CD54/74HCT147	High-Speed CMOS Logic, 10-to-4-Line Priority Encoder (5 pages)
1645	CD54/74HC151, CD54/74HCT151	High-Speed CMOS Logic, 8-Input Multiplexer (5 pages)
1774	CD54/74HC153, CD54/74HCT153	High-Speed CMOS Logic, Dual 4-Input Multiplexer (5 pages)
1657	CD54/74HC154, CD54/74HCT154	High-Speed CMOS Logic, 4-to-16 Line Decoder/ Demultiplexer (6 pages)
1642	CD54/74HC157, CD54/74HCT157, CD54/74HC158, CD54/74HCT158	High-Speed CMOS Logic, Quad 2-Input Multiplexers (5 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
1550	CD54/74HC/ HCT160, CD54/ 74HC/HCT161, CD54/74HC/HCT162, CD54/74HC/HCT163	High-Speed CMOS Logic, Presettable Counters (10 pages)
1658	CD54/74HC164, CD54/74HCT164	High-Speed CMOS Logic, 8-Bit Serial-In/Parallel-Out Shift Register (5 pages)
1672	CD54/74HC165, CD54/74HCT165	High-Speed CMOS Logic, 8-Bit Parallel-In/Serial-Out Shift Register (6 pages)
1501	CD54/74HC166, CD54/74HCT166	High-Speed CMOS Logic, 8-Bit Parallel-In/Serial-Out Shift Register (6 pages)
1641	CD54/74HC173, CD54/74HCT173	High-Speed CMOS Logic, Quad D-Type Flip-Flop, 3-State Positive-Edge Triggered (6 pages)
1608	CD54/74HC174, CD54/74HCT174	High-Speed CMOS Logic, Hex D-Type Flip-Flop with Reset (5 pages)
1474	CD54/74HC175, CD54/74HCT175	High-Speed CMOS Logic, Quad D Flip-Flop with Reset (5 pages)
1829	CD54/74HC181, CD54/74HCT181	High-Speed CMOS Logic, 4-Arithmetic Logic Unit (6 pages)
1830	CD54/74HC182, CD54/74HCT182	High Speed CMOS Logic, Look Ahead Carry Generator (1 pages) Obsolete
1662	CD54/74HC190, CD54/74HCT190, CD54/74HC191, CD54/74HCT191	High-Speed CMOS Logic, Presettable Synchronous 4-Bit Up/Down Counters (9 pages)
1674	CD54/74HC192, CD54/74HCT192, CD54/74HC193, CD54/HCT193	High-Speed CMOS Logic, Presettable Synchronous 4-Bit Up/Down Counters (10 pages)
1668	CD54/74HC194, CD54/74HCT194	High-Speed CMOS Logic, 4-Bit Bidirectional Universal Shift Register (6 pages)
1482	CD54/74HC195, CD54/74HCT195	High-Speed CMOS Logic, 4-Bit Parallel Access Register (6 pages)
1670	CD54/74HC221, CD54/74HCT221	High-Speed CMOS Logic, Dual Monostable Multivibrator with Reset (7 pages)
1656	CD54/74HC240, CD54/74HC241, CD54/74HC244, CD54/74HCT240, CD54/74HCT241, CD54/74HCT244	High-Speed CMOS Logic, Octal Buffer/Line Drivers, 3-State (6 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
1488	CD54/74HC242, CD54/74HCT242, CD54/74HC243, CD54/74HCT243	High-Speed CMOS Logic, Quad-Bus Transceiver with 3-State Outputs (6 pages)
1651	CD54/74HC245, CD54/74HCT245	High-Speed CMOS Logic, Octal-Bus Transceiver, 3-State, Non-Inverting (5 pages)
1489	CD54/74HC251, CD54/74HCT251	High-Speed CMOS Logic, 8-Input Multiplexer; 3-State (6 pages)
1673	CD54/74HC253, CD54/74HCT253	High-Speed CMOS Logic, Dual 4-Input Multiplexer (5 pages)
1650	CD54/74HC257, CD54/74HCT257	High-Speed CMOS Logic, Quad 2-Input Multiplexer with 3-State Non-Inverting Outputs (4 pages)
1775	CD54/74HC258, CD54/74HCT258	High-Speed CMOS Logic, Quad 2-Input Multiplexer with 3-State Inverting Outputs (5 pages)
1727	CD54/74HC259, CD54/74HCT259	High-Speed CMOS Logic, 8-Bit Addressable Latch (7 pages)
1479	CD54/74HC273, CD54/74HCT273	High-Speed CMOS Logic, Octal D Flip-Flop with Reset (5 pages)
1669	CD54/74HC280, CD54/74HCT280	High-Speed CMOS Logic, 9-Bit Odd/Even Parity Generator/Checker (4 pages)
1848	CD54/74HC283, CD54/74HCT283	High-Speed CMOS Logic, 4-Bit Binary Full Adder With Fast Carry (5 pages)
1852	CD54/74HC297, CD54/74HCT297	High-Speed CMOS Logic, Digital Phase-Locked-Loop (7 pages)
1485	CD54/74HC299, CD54/74HCT299	High-Speed CMOS Logic, 8-Bit Universal Shift Register; 3-State (7 pages)
1690	CD54/74HC354, CD54/74HCT354, CD54/74HC356, CD54/74HCT356	High-Speed CMOS Logic, 8-Input Multiplexer/Register, 3-State (10 pages)
1539	CD54/74HC365, CD54/74HCT365, CD54/74HC366, CD54/74HCT366	High-Speed CMOS Logic, Hex Buffer/Line Driver, 3-State Non-Inverting and Inverting (5 pages)
1538	CD54/74HC367, CD54/74HCT367, CD54/74HC368, CD54/74HCT368	High-Speed CMOS Logic, Hex Buffer/Line Driver, 3-State (5 pages)
1679	CD54/74HC373, CD54/74HCT373, CD54/74HC573, CD54/74HCT573	High-Speed CMOS Logic, Octal Transparent Latch, 3-State Output (6 pages)
1663	CD54/74HC374, CD54/74HCT374, CD54/74HC574, CD54/74HCT574	High-Speed CMOS Logic, Octal D-Type Flip-Flop, 3-State Positive-Edge Triggered (5 pages)
1675	CD54/74HC377, CD54/74HCT377	High-Speed CMOS Logic, Octal D-Type Flip-Flop with Data Enable (6 pages)
1838	CD54/74HC390, CD54/74HCT390	High-Speed CMOS Logic, Dual Decade Ripple Counter (6 pages)
1653	CD54/74HC393, CD54/74HCT393	High-Speed CMOS Logic, Dual 4-Stage Binary Counter (5 pages)
1599	CD54/74HC533, CD54/74HCT533, CD54/74HC563, CD54/74HCT563	High-Speed CMOS Logic, Octal Inverting Transparent Latch, 3-State Outputs (6 pages)
1640	CD54/74HC534, CD54/74HCT534, CD54/74HC564, CD54/74HCT564	High-Speed CMOS Logic, Octal D-Type Flip-Flop, 3-State, Inverting Positive-Edge Triggered (5 pages)
1659	CD54/74HC540, CD54/74HCT540, CD54/74HC541, CD54/74HCT541	High-Speed CMOS Logic, Octal Buffer and Line Drivers 3-State (5 pages)
1828	CD54/74HC583, CD54/74HCT583	High-Speed CMOS Logic, 4-Bit BCD Full Adder with Fast Carry (5 pages)
1915	CD54/74HC597, CD54/74HCT597	High Speed CMOS Logic, 8-Bit Shift Register with Input Storage (8 pages)
1677	CD54/74HC640, CD54/74HCT640, CD54/74HC643, CD54/74HCT643	High-Speed CMOS Logic, Octal 3-State Bus Transceivers (5 pages)
1664	CD54/74HC646, CD54/74HCT646, CD54/74HC648, CD54/74HCT648	High-Speed CMOS Logic, Octal Bus Transceiver/ Register, 3-State (7 pages)
2229	CD54/74HC651, CD54/74HC652, CD54/74HCT651, CD54/74HCT652	Octal-Bus Transceiver/ Registers, 3-State (7 pages)
1660	CD54/74HC670, CD54/74HCT670	High-Speed CMOS Logic, 4 x 4 Register File (7 pages)
1646	CD54/74HC688, CD54/74HCT688	High-Speed CMOS Logic, 8-Bit Magnitude Comparator (4 pages)
1776	CD54/74HC4002, CD54/74HCT4002	High-Speed CMOS Logic, Dual 4-Input NOR Gate (4 pages)
1678	CD54/74HC4015, CD54/74HCT4015	High-Speed CMOS Logic, Dual 4-Stage Static Shift Register (6 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
1917	CD54/74HC4016, CD54/74HCT4016	High-Speed CMOS Logic, Quad Bilateral Switch (7 pages)
1639	CD54/74HC4017, CD54/74HCT4017	High-Speed CMOS Logic, Decade Counter/Divider with 10 Decoded Outputs (6 pages)
1484	CD54/74HC4020, CD54/74HCT4020	High-Speed CMOS Logic, 14-Stage Binary Counter (5 pages)
1683	CD54/74HC4024, CD54/74HCT4024	High-Speed CMOS Logic, 7-Stage Binary Ripple Counter (5 pages)
1483	CD54/74HC4040, CD54/74HCT4040	High-Speed Logic, 12-Stage Binary Counter (5 pages)
1854	CD54/74HC4046A, CD54/74HCT4046A	High-Speed CMOS Logic, Phase-Locked-Loop with VCO (17 pages)
1543	CD54/74HC4049, CD54/74HC4050	High-Speed CMOS Logic, Hex Buffers, Inverting and Non-Inverting (4 pages)
1676	CD54/74HC4051, CD54/74HCT4051, CD54/74HC4052, CD54/74HCT4052, CD54/74HC4053, CD54/74HCT4053	High-Speed CMOS Logic, Analog Multiplexers/ Demultiplexers (9 pages)
1853	CD54/74HC4059, CD54/74HCT4059	High-Speed CMOS Logic, CMOS Programmable Divide-by-"N" Counter (7 pages)
1654	CD54/74HC4060, CD54/74HCT4060	High-Speed CMOS Logic, 14-Stage Binary Counter with Oscillator (6 pages)
1777	CD54/74HC4066, CD54/74HCT4066	High-Speed CMOS Logic, Quad Bilateral Switch (6 pages)
1783	CD54/74HC4067, CD54/74HCT4067	High-Speed CMOS Logic, 16-Channel Analog Multiplexer/Demultiplexer (6 pages)
1778	CD54/74HC4075, CD54/74HCT4075	High-Speed CMOS Logic, Triple 3-Input OR Gate (4 pages)
1779	CD54/74HC4094, CD54/74HCT4094	High-Speed CMOS Logic, 8-Stage Shift-and-Store Bus Register - 3-State (7 pages)
1916	CD54/74HC4316, CD54/74HCT4316	High-Speed CMOS Logic, Quad Analog Switch with Level Translation (7 pages)
2145	CD54/74HC4351, CD54/74HCT4351, CD54/74HC4352, CD54/74HCT4352, CD54/74HC4353, CD54/74HCT4353	Analog Multiplexers/ Demultiplexers With Latch (13 pages)
1823	CD54/74HC4510, CD54/74HCT4510, CD54/74HC4516, CD54/74HCT4516	High-Speed CMOS Logic, Presettable Synchronous 4-Bit Up/Down Counters (10 pages)
1786	CD54/74HC4511, CD54/74HCT4511	High-Speed CMOS Logic, BCD-to-7 Segment Latch/ Decoder/Drivers (5 pages)
1597	CD54/74HC4514, CD54/74HCT4514, CD54/74HC4515, CD54/74HCT4515	High-Speed CMOS Logic, 4-to-16 Line Decoder/ Demultiplexer with Input Latches (6 pages)
1665	CD54/74HC4518, CD54/74HCT4518, CD54/74HC4520, CD54/74HCT4520	High-Speed CMOS Logic, Dual Synchronous Counters (6 pages)
1671	CD54/74HC4538, CD54/74HCT4538	High-Speed CMOS Logic, Dual Retriggerable Precision Monostable Multivibrator (8 pages)
1822	CD54/74HC4543, CD54/74HCT4543	High-Speed CMOS Logic, BCD-to-7 Segment Latch/ Decoder/Driver for LCDs (6 pages)
2122	CD54/74HC7030, CD54/74HCT7030	64-Word x 9-Bit FIFO Register; 3-State (13 pages)
1872	CD54/74HC7038, CD54/74HCT7038	High-Speed CMOS Logic, 9-Bit Bus Transceiver with Latch (1 pages) Obsolete
1920	CD54/74HC7046A, CD54/74HCT7046A	Phase-Locked Loop with VCO and Lock Dectector (16 pages)
1780	CD54/74HC7266	High-Speed CMOS Logic, Quad 2-Input Exclusive-NOR Gate (4 pages)
1596	CD54/74HC40102, CD54/74HCT40102, CD54/74HC40103, CD54/74HCT40103	High-Speed CMOS Logic, 8-Stage Synchronous Down Counters (9 pages)
1661	CD54/74HC40104, CD54/74HCT40104	High-Speed CMOS Logic, 4-Bit Universal Bidirectional Shift Register (6 pages)
1834	CD54/74HC40105, CD54/74HCT40105	High-Speed CMOS Logic, 4-Bit x 16-Word FIFO Register (9 pages)
1655	CD54/74HCU04	High-Speed CMOS Logic, Hex Inverter (4 pages)
CD54 HC/HCT HI-REL LOGIC DATA SHEETS		
3753	CD54HC00/3A, CD54HCT00/3A	Quad 2-Input NAND Gate (1 pages)
3754	CD54HC02/3A, CD54HCT02/3A	Quad 2-Input NOR Gate (1 pages)
3755	CD54HC03/3A, CD54HCT03/3A	Quad 2-Input NAND Gate (1 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
3756	CD54HC04/3A, CD54HCT04/3A	Hex Inverter (1 pages)
3757	CD54HC08/3A, CD54HCT08/3A	Quad 2-Input AND Gate (1 pages)
3758	CD54HC10/3A, CD54HCT10/3A	Triple 3-Input NAND Gate (1 pages)
3759	CD54HC11/3A, CD54HCT11/3A	Triple 3-Input AND Gate (1 pages)
3760	CD54HC14/3A, CD54HCT14/3A	Hex Inverting Schmitt Trigger (1 pages)
3761	CD54HC20/3A, CD54HCT20/3A	Dual 4-Input NAND Gate (1 pages)
3762	CD54HC21/3A, CD54HCT21/3A	Dual 4-Input AND Gate (1 pages)
3763	CD54HC27/3A, CD54HCT27/3A	Triple 3-Input NOR Gate (1 pages)
3764	CD54HC30/3A, CD54HCT30/3A	8-Input NAND Gate (1 pages)
3765	CD54HC32/3A, CD54HCT32/3A	Quad 2-Input OR Gate (1 pages)
3766	CD54HC42/3A, CD54HCT42/3A	BCD-to-Decimal Decoder (1-to-10) (1 pages)
3767	CD54HC73/3A	Dual J-K Flip-Flop with Set and Reset (1 pages)
3768	CD54HC74/3A, CD54HCT74/3A	Dual D Flip-Flop with Set and Reset (1 pages)
3769	CD54HC75/3A, CD54HCT75/3A	Quad Bistable Transparent Latch (1 pages)
3770	CD54HC85/3A, CD54HCT85/3A	4-Bit Magnitude Comparator (1 pages)
3771	CD54HC86/3A, CD54HCT86/3A	Quad 2-Input EXCLUSIVE-OR Gate (1 pages)
3772	CD54HC107/3A, CD54HCT107/3A	Dual J-K Flip-Flop with Reset (1 pages)
3773	CD54HC109/3A, CD54HCT109/3A	Dual J-$\overline{K}$ Flip-Flop with Set and Reset (1 pages)
3774	CD54HC112/3A, CD54HCT112/3A	Dual J-K Flip-Flop with Set and Reset (1 pages)
3775	CD54HC123/3A, CD54HCT123/3A	Dual Retriggerable Monostable Multivibrator with Reset (1 page)
3776	CD54HC125/3A, CD54HCT125/3A	Quad Three-State Buffer (1 page)
3777	CD54HC126/3A, CD54HCT126/3A	Quad Three-State Buffer (1 page)
3778	CD54HC132/3A, CD54HCT132/3A	Quad 2-Input NAND Schmitt Trigger (1 pages)
3779	CD54HC138/3A CD54HCT138/3A	3-to-8-Line Decoder/ Demultiplexer (1 pages)
3780	CD54HC139/3A CD54HCT139/3A	Dual 2-of-4-Line Decoder/ Demultiplexer (1 pages)
3781	CD54HC147/3A	10-to-4-Line Priority Encoder (1 pages)
3782	CD54HC151/3A CD54HCT151/3A	8-Input Multiplexer (1 pages)
3783	CD54HC153/3A CD54HCT153/3A	Dual 4-Input Multiplexer (1 pages)
3784	CD54HC154/3A CD54HCT154/3A	4-to-16-Line Decoder/Demultiplexer (1 pages)
3785	CD54HC157/3A CD54HCT157/3A	Quad 2-Input Multiplexer (1 pages)
3786	CD54HC158/3A, CD54HCT158/3A	Quad 2-Input Multiplexer (1 pages)
3787	CD54HC160/3A, CD54HCT160/3A	Synchronous Presettable Counters (1 pages)
3788	CD54HC161/3A, CD54HCT161/3A	Synchronous Presettable Counters (1 pages)
3789	CD54HC162/3A, CD54HCT162/3A	Synchronous Presettable Counters (1 pages)
3790	CD54HC163/3A, CD54HCT163/3A	Synchronous Presettable Counters (1 pages)
3791	CD54HC164/3A, CD54HCT164/3A	8-Bit Serial-In/Parallel-Out Shift Register (1 pages)
3792	CD54HC165/3A, CD54HCT165/3A	8-Bit Parallel-In/Serial-Out Shift Register (1 pages)
3793	CD54HC166/3A, CD54HCT166/3A	8-Bit Parallel-In Serial-Out Shift Register (1 pages)
3794	CD54HC173/3A, CD54HCT173/3A	Quad D-Type Flip-Flop, Three-State (1 pages)
3795	CD54HC174/3A, CD54HCT174/3A	Hex D-Type Flip-Flop with Reset (1 pages)
3796	CD54HC175/3A, CD54HCT175/3A	Quad D-Type Flip-Flop with Reset (1 pages)
3797	CD54HC190/3A	Presettable Synchronous Up/ Down Counter (1 pages)
3798	CD54HC191/3A, CD54HCT191/3A	Presettable Synchronous Up/ Down Counters (1 pages)
3799	CD54HC192/3A	Presettable Synchronous Up/ Down Counters (1 pages)
3800	CD54HC193/3A, CD54HCT193/3A	Presettable Synchronous Up/ Down Counters (1 pages)
3801	CD54HC194/3A, CD54HCT194/3A	4-Bit Bidirectional Universal Shift Register (1 pages)
3802	CD54HC195/3A	4-Bit Parallel Access Shift Register (1 pages)
3803	CD54HC221/3A	Dual Monostable Multivibrator with RESET (1 pages)

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3804	CD54HC237/3A	3-to-8-Line Decoder/ Demultiplexer (1 pages)
3805	CD54HC238/3A, CD54HCT238/3A	3-to-8-Line Decoder/ Demultiplexer (1 pages)
3806	CD54HC240/3A, CD54HCT240/3A	Octal Buffer/Line Driver Three-State, Inverting (1 pages)
3807	CD54HCT241/3A	Octal Buffer/Line Driver, Three-State, Non-Inverting (1 pages)
3808	CD54HC243/3A, CD54HCT243/3A	Quad Bus Transceiver, Three-State, Non-Inverting (1 pages)
3809	CD54HC244/3A, CD54HCT244/3A	Octal Buffer/Line Driver, Three-State (1 pages)
3810	CD54HC245/3A, CD54HCT245/3A	Octal Bus Transceiver, Three-State (1 pages)
3811	CD54HC251/3A, CD54HCT251/3A	8-Input Multiplexer, Three-State (1 pages)
3812	CD54HC253/3A	Dual 4-Input Multiplexer, Three-State (1 pages)
3813	CD54HC257/3A, CD54HCT257/3A	Quad 2-Input Multiplexer, Three-State (1 pages)
3814	CD54HCT258/3A	Quad 2-Line-to-4-Line Data Selector (1 pages)
3815	CD54HC259/3A, CD54HCT259/3A	8-Bit Addressable Latch (1 pages)
3816	CD54HC273/3A, CD54HCT273/3A	Octal D-Type Flip-Flop with Reset (1 pages)
3817	CD54HC280/3A, CD54HCT280/3A	9-Bit Odd/Even Parity Generator/Checker (1 pages)
3818	CD54HC283/3A, CD54HCT283/3A	4-Bit Full Adder with Fast Carry (1 pages)
3819	CD54HC297/3A	Digital Phase-Locked-Loop (1 pages)
3820	CD54HC299/3A, CD54HCT299/3A	8-Bit Universal Shift Register, Three-State (1 pages)
3821	CD54HC354/3A	8-Input Multiplexer/Register, Three-State (1 pages)
3822	CD54HC356/3A	8-Input Multiplexer/Register, Three-State (1 pages)
3823	CD54HC365/3A, CD54HCT365/3A	Hex Buffer/Line Driver, Three-State (1 pages)
3824	CD54HC366/3A, CD54HCT366/3A	Hex Buffer/Line Driver Three-State, Inverting (1 pages)
3825	CD54HC367/3A, CD54HCT367/3A	Hex Buffer/Line Driver, Three-State (1 pages)
3826	CD54HC368/3A	Hex Buffer/Line Driver, Three-State, Inverting (1 pages)
3827	CD54HC373/3A, CD54HCT373/3A	Octal Transparent Latch, Three-State (1 pages)
3828	CD54HC374/3A, CD54HCT374/3A	Octal D-Type Flip-Flop, Three-State (1 pages)
3829	CD54HC377/3A, CD54HCT377/3A	Octal D-Type Flip-Flop with Data Enable (1 pages)
3830	CD54HCT390/3A	Dual Decade Ripple Counter (1 pages)
3831	CD54HC393/3A, CD54HCT393/3A	Dual 4-Bit Binary Ripple Counter (1 pages)
3832	CD54HCT423/3A	Dual Retriggerable Monostable Multivibrator with Reset (1 pages)
3833	CD54HC533/3A, CD54HCT533/3A	Octal Transparent Latch, Three-State, Inverting (1 pages)
3834	CD54HC534/3A, CD54HCT534/3A	Octal D-Type Flip-Flop, Three-State, Inverting (1 pages)
3835	CD54HC540/3A	Octal Buffer/Line Driver, Three-State, Inverting (1 pages)
3836	CD54HC541/3A, CD54HCT541/3A	Octal Buffer/Line Driver, Three-State (1 pages)
3837	CD54HC563/3A	Octal Transparent Latch, Three-State, Inverting (1 pages)
3838	CD54HC564/3A, CD54HCT564/3A	Octal D-Type Flip-Flop, Three-State, Inverting (1 pages)
3839	CD54HC573/3A, CD54HCT573/3A	Octal Transparent Latch, Three-State (1 pages)
3840	CD54HC574/3A, CD54HCT574/3A	Octal D-Type Flip-Flop, Three-State (1 pages)
3841	CD54HC597/3A	8-Bit Shift Register with I/P Latch (1 pages)
3842	CD54HC640/3A, CD54HCT640/3A	Octal Bus Transceiver, Three-State, Inverting (1 pages)
3843	CD54HC646/3A, CD54HCT646/3A	Octal Bus Transceiver/Register, Three-State, Non-Inverting (1 pages)
3844	CD54HC670/3A, CD54HCT670/3A	4 x 4 Register File, Three-State (1 pages)
3845	CD54HC688/3A, CD54HCT688/3A	8-Bit Magnitude Comparator (1 pages)
3846	CD54HC4002/3A	Dual 4-Input NOR Gate (1 pages)
3847	CD54HC4015/3A	Dual 4-Bit Serial-In/Parallel-Out Shift Register (1 pages)
3848	CD54HC4017/3A, CD54HCT4017/3A	Johnson Decade Counter with 10 Decoded Outputs (1 pages)
3849	CD54HC4020/3A, CD54HCT4020/3A	14-Stage Binary Ripple Counter (1 pages)

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3850	CD54HC4024/3A, CD54HCT4024/3A	7-Stage Binary Ripple Counter (1 pages)
3851	CD54HC4040/3A, CD54HCT4040/3A	12-Stage Binary Ripple Counter (1 pages)
3852	CD54HC4046A/3A, CD54HCT4046A/3A	Phase-Locked Loop with VCO (1 pages)
3853	CD54HC4049/3A	Hex Inverting HIGH-to-LOW Level Shifter (1 pages)
3854	CD54HC4050/3A	Hex HIGH-to-LOW Level Shifter (1 pages)
3855	CD54HC4051/3A, CD54HCT4051/3A	8-Channel Analog Multiplexer/ Demultiplexer (2 pages)
3856	CD54HC4052/3A, CD54HCT4052/3A	Dual 4-Channel Analog Multiplexer/Demultiplexer (2 pages)
3857	CD54HC4053/3A, CD54HCT4053/3A	Triple 2-Channel Analog Multiplexer/Demultiplexer (2 pages)
3858	CD54HC4059/3A, CD54HCT4059/3A	Programmable Divide-by-"N" Counter (1 pages)
3859	CD54HC4060/3A, CD54HCT4060/3A	14-Stage Binary Ripple Counter with Oscillator (1 pages)
3860	CD54HC4066/3A	Quad Bilateral Switch (1 pages)
3861	CD54HC4075/3A, CD54HCT4075/3A	Triple 3-Input OR Gate (1 pages)
3862	CD54HC4094/3A	8-Stage Shift-and-Store Bus Register (1 pages)
3863	CD54HC4316/3A	Quad Analog Switch (1 pages)
3864	CD54HC4351/3A	Analog Multiplexer with Latch (2 pages)
3865	CD54HC4511/3A	BCD-to-7-Segment Latch/ Decoder/Driver (1 pages)
3866	CD54HC4514/3A	4-to-16-Line Decoder/ Demultiplexer with Input Latches (1 pages)
3867	CD54HC4515/3A	4-to-16-Line Decoder with Input Latches (1 pages)
3868	CD54HC4516/3A	Up/Down Counter, Binary (1 pages)
3869	CD54HC4520/3A, CD54HCT4520/3A	Dual 4-Bit Synchronous Binary Counter (1 pages)
3870	CD54HC4538/3A, CD54HCT4538/3A	Dual Precision Monostable Multivibrator (1 pages)
3871	CD54HC7266/3A	Quad Exclusive NOR (1 pages)
3872	CD54HCT40102/3A	8-Bit Synchronous BCD Down Counter (1 pages)
3873	CD54HC40103/3A	8-Bit Binary Down Counter (1 pages)
3874	CD54HC40105/3A, CD54HCT40105/3A	4-Bits x 16 Words FIFO Register (1 pages)
3875	CD54HCU04/3A	Hex Inverter (1 pages)
LOGIC TECHNICAL INFORMATION		
7001	54/74 AC/ACT Series	System Design (14 pages)
7002	54/74 AC/ACT Series	Behavioral Models (4 pages)
7003	54/74 AC/ACT Series	Printed Circuit Board Design Using AC/ACT Logic Devices (4 pages)
LOGIC APPLICATION NOTES		
96101	AN6101	COS/MOS Phase-Locked-Loop A Versatile Building Block for Micro-Power Digital and Analog Applications (4 pages)
96230	AN6230	Using the CD4047A in COS/MOS Timing Applications (13 pages)
96315	AN6315	COS/MOS Interfacing Simplified (3 pages)
96346	AN6346	Applications of CD4093B COS/MOS Schmitt Trigger (3 pages)
96374	AN6374	Applications of the COS/MOS CD4059A Programmable Divide-by-N Counter: Digital Frequency Synthesis for FM Tuners and CB Transceivers (12 pages)
96466	AN6466	Astable and Monostable Oscillators Using COS/MOS Digital Integrated Circuits (6 pages)
96498	AN6498	Design of Fixed and Programmable Counters Using the CD4018 COS/MOS Presettable Divide-By-"N" Counter (6 pages)
96525	AN6525	Guide to Better Handling and Operation of CMOS Integrated Circuits (3 pages)
96532	AN6532	Fundamentals of Testing COS/MOS Integrated Circuits (9 pages)
96558	AN6558	Understanding Buffered and Unbuffered CMOS Characteristics (5 pages)
96587	AN6587	Noise Immunity of COS/MOS B-Series Integrated Circuits (8 pages)

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96595	AN6595	Interfacing Analog and Digital Displays with CMOS Integrated Circuits (6 pages)
96602	AN6602	Interfacing COS/MOS with Other Logic Families (12 pages)
96716	AN6716	Low-Power Digital Frequency Synthesizers Utilizing COS/MOS ICs (15 pages)
96739	AN6739	COS/MOS Rate Multipliers-Versatile Circuits for Synthesizing Digital Functions (12 pages)
96883	AN6883	Simplified Design of Astable RC Oscillators Using the CD4060B or Two CMOS Inverters (1 pages)
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97315	AN7315	Power Consumption in QMOS Logic Circuits (6 pages)
97323	AN7323	Modification of LSTTL Test Programs to Test HCT High-Speed-CMOS Logic ICs (4 pages)
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97330	AN7330	Replacing LSTTL with QMOS High-Speed Logic ICs (6 pages)
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98823	AN8823	CMOS Phase-Locked-Loop Applications Using the CD54/74HC/HCT4046A and CD54/74HC/HCT7046A (23 pages)
98906	AN8906	Noise Aspects of Applying Advanced CMOS (AC/ACT) Semiconductors (62 pages) or Call Harris Semiconductor (407) 724-7237 and request by mail
98910	AN8910	An Introduction to Behavioral Simulation Using Harris AC/ACT Logic SmartModels™ From Logic Automation Inc. (9 pages)
99001	AN9001	Measuring Ground and VCC Bounce in Advanced High Speed (AC/ACT/FCT) CMOS Logic ICs (4 pages)
99004	AN9004	Advanced High Speed CMOS Logic in a PCB Transmission Line Environment (7 pages)

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27007	BR007	Complete Listing of Harris Sales Offices, Representatives and Authorized Distributors World Wide (7 pages)
7031	-	Harris Semiconductor Part Number Nomenclature Guide (16 pages)
MICROPROCESSOR INFORMATION		
7019	DB303, Section 9	Microprocessor Packaging Information (10 pages)
7024	DB260.2, Section 7	Operating and Handling Considerations (5 pages)
7025	DB260.2, Section 7	CDP6805 Package Selection (13 pages)
7026	DB260.2, Section 4	CDP6805/CDP68HC05 Instruction Set (10 pages)
7027	DB260.2, Section 8	Package and Ordering Information (8 pages)
MICROPROCESSOR DATA SHEETS		
2957	80C86	CMOS 16 Bit Microprocessor (32 pages)
2949	80C88	CMOS 8/16 Bit Microprocessor (27 pages)
2947	80C286	High Performance Microprocessor With Memory Management and Protection (50 pages)
2948	80C286/883	High Performance Microprocessor With Memory Management and Protection (12 pages)
2967	82C37A	CMOS High Performance Programmable DMA Controller (22 pages)
2958	82C50A	CMOS Asynchronous Communications Element (20 pages)
2950	82C52	CMOS Serial Controller Interface (18 pages)
2970	82C54	CMOS Programmable Interval Timer (17 pages)
2969	82C55A	CMOS Programmable Peripheral Interface (22 pages)
2784	82C59A	CMOS Priority Interrupt Control ler (19 pages)
2975	82C82	CMOS Octal Latching Bus Driver (7 pages)
2971	82C83H	CMOS Octal Latching Inverting Bus Driver (7 pages)

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2974	82C84A	CMOS Clock Generator Driver (10 pages)
2976	82C85	CMOS Static Clock Controller/ Generator (19 pages)
2977	82C86H	CMOS Octal Bus Transceiver (7 pages)
2978	82C87H	CMOS Octal Inverting Bus Transceiver (7 pages)
2979	82C88	CMOS Bus Controller (9 pages)
2980	82C89	CMOS Bus Arbiter (13 pages)
2965	82C237	CMOS High Performance Programmable DMA Controller (26 pages)
2966	82C284	Clock Generator and Ready Interface for 80C286 Processors (10 pages)
2968	82C284/883	Clock Generator and Ready Interface for 80C286 Processors (9 pages)
1441	CDP1802A/3, CDP1802AC/3	High-Reliability CMOS 8-Bit Microprocessor (8 pages)
1305	CDP1802A, CDP1802AC, CDP1802BC	CMOS 8 Bit Microprocessors (24 pages)
1370	CDP1805AC, CDP1806AC	CMOS 8-Bit Microprocessor With On-Chip RAM* and Counter/Timer (15 pages)
2983	CDP1821C/3	High-Reliability CMOS 1024-Word x 1-Bit Static RAM (5 pages)
1074	CDP1822, CDP1822C	256-Word x 4-Bit LSI Static RAM (6 pages)
2981	CDP1822C/3	High-Reliability CMOS 256-Word x 4-Bit LSI Static RAM (5 pages)
1198	CDP1823, CDP1823C	128-Word x 8-Bit LSI Static RAM (6 pages)
2982	CDP1823C/3	High-Reliability CMOS 128-Word x 8-Bit Static RAM (5 pages)
1103	CDP1824, CDP1824C	32-Word x 8-Bit Static RAM (5 pages)
1717	CDP1824/3, CDP1824C/3	High-Reliability CMOS 32-Word x 8 Bit Static Random-Access Memory (5 pages)
1311	CDP1826C	CMOS 64-Word x 8-Bit Static RAM (7 pages)
1056	CDP1851, CDP1851C	CMOS Programmable I/O Interface (12 pages)

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1166	CDP1852, CDP1852C	Byte-Wide Input/Output Port (8 pages)
1694	CDP1852/3, CDP1852C/3	High-Reliability Byte-Wide Input/ Output Port (5 pages)
1189	CDP1853, CDP1853C	N-Bit 1 of 8 Decoder (4 pages)
1713	CDP1853/3, CDP1853C/3	High-Reliability CMOS N-Bit 1 of 8 Decoder (4 pages)
1193	CDP1854A, CDP1854AC	Programmable Universal Asynchronous Receiver/ Transmitter (UART) (17 pages)
1715	CDP1854A/3, CDP1854AC/3	High Reliability CMOS Program mable Universal Asynchronous Receiver/Transmitter (UART) (9 pages)
1053	CDP1855, CDP1855C	8-Bit Programmable Multiply/ Divide Unit (13 pages)
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1341	CDP1878, CDP1878C	CMOS Dual Counter-Timer (13 pages)
1360	CDP1879, CDP1879C-1	CMOS Real-Time Clock (16 pages)
1367	CDP1881, CDP1881C, CDP1882, CDP1882C	CMOS 6-Bit Latch and Decoder Memory Interfaces (6 pages)
1507	CDP1883, CDP1883C	CMOS 7-Bit Latch and Decoder Memory Interfaces (5 pages)
1328	CDP6402, CDP6402C	CMOS Universal Asynchronous Receiver/Transmitter (UART) (9 pages)
2747	CDP65C51, CDP65C51A	CMOS Asynchronous Communications Interface Adapter (ACIA) (18 pages)
2746	CDP6805E2, CDP6805E2C, CDP6805E3, CDP6805E3C	CMOS 8-Bit Microprocessor (28 pages)
1369	CDP6805F2, CDP6805F2C	CMOS High Performance Silicon Gate 8-Bit Microcontroller (16 pages)
1364	CDP6805G2, CDP6805G2C	CMOS High Performance Silicon Gate 8-Bit Microcontroller (16 pages)
1375	CDP6818	CMOS Real-Time Clock with RAM (19 pages)
2041	CDP6818A	CMOS Real-Time Clock with RAM (19 pages)
1377	CDP6823	CMOS Parallel Interface (14 pages)
1487	CDP6853	CMOS Asynchronous Communications Interface Adapter (ACIA) with MOTEL Bus (19 pages)
2754	CDP68EM05C4, CDP68EM05C4N	CMOS High Performance Silicon Gate 8-Bit Microcontroller Emulator (6 pages)
2755	CDP68EM05D2, CDP68EM05D2N	CMOS High Performance Silicon Gate 8-Bit Microcontroller Emulator (7 pages)
2748	CDP68HC05C4, CDP68HC05C8, CDP68HCL05C4, CDP68HCL05C8, CDP68HSC05C4, CDP68HSC05C8	8-Bit Microcontroller Series (51 pages)
1557	CDP68HC05D2	8-Bit Microcontroller (40 pages)
2757	CDP68HC05J3	8-Bit Microcontroller Series (23 pages)
1963	CDP68HC68A2	CMOS Serial 10-Bit A/D Con verter (17 pages)
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2954	HD-4702	CMOS Programmable Bit Rate Generator (6 pages)
2955	HD-4702/883	CMOS Programmable Bit Rate Generator (6 pages)
2956	HD-6402	CMOS Universal Asynchronous Receiver/Transmitter (UART) (7 pages)
2953	HD-6402/883	CMOS Universal Asynchronous Receiver Transmitter (UART) (6 pages)
2952	HD-6408	CMOS Asynchronous Serial Manchester Adapter (ASMA) (7 pages)
2951	HD-6409	CMOS Manchester Encoder-Decoder (13 pages)
2959	HD-6409/883	CMOS Manchester Encoder-Decoder (6 pages)
2994	HM-6504	4096 x 1 CMOS RAM (6 pages)
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2984	HM-6508	1024 x 1 CMOS RAM (5 pages)
2985	HM-6508/883	1024 x 1 CMOS RAM (8 pages)
2995	HM-6514	1024 x 4 CMOS RAM (6 pages)
2996	HM-6514/883	1024 x 4 CMOS RAM (8 pages)
2998	HM-6516	2K x 8 CMOS RAM (6 pages)
2999	HM-6516/883	2K x 8 CMOS RAM (8 pages)
2987	HM-6518	1024 x 1 CMOS RAM (5 pages)
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2988	HM-6551/883	256 x 4 CMOS RAM (8 pages)
2991	HM-6561	256 x 4 CMOS RAM (5 pages)
2990	HM-6561/883	256 x 4 CMOS RAM (8 pages)
3006	HM-6564	8K x 8, 16K x 4 CMOS RAM Module (6 pages)
3000	HM-65162	2K x 8 Asynchronous CMOS Static RAM (7 pages)
3001	HM-65162/883	2K x 8 Asynchronous CMOS Static RAM (10 pages)
3002	HM-65262	16K x 1 Asynchronous CMOS Static RAM (6 pages)
3003	HM-65262/883	16K x 1 Asynchronous CMOS Static RAM (8 pages)
3005	HM-65642	8K x 8 Asynchronous CMOS Static RAM (7 pages)
3004	HM-65642/883	8K x 8 Asynchronous CMOS Static RAM (9 pages)
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3016	HM-6617/883	2K x 8 CMOS PROM (7 pages)
3012	HM-6642	512 x 8 CMOS PROM (7 pages)
3013	HM-6642/883	512 x 8 CMOS PROM (8 pages)
3014	HM-8808, HM-8808A	8K x 8 Asynchronous CMOS Static RAM Module (8 pages)
3007	HM-8816H	16K x 8 High Speed Asynchronous CMOS Static RAM Module (5 pages)
3011	HM-91M2	1M Bit Asynchronous CMOS Static RAM Module (7 pages)
3009	HM-92560	256K Synchronous CMOS RAM Module (5 pages)
3010	HM-92570	256K Buffered Synchronous CMOS RAM Module (5 pages)
2963	HS-3182	ARINC 429 Bus Interface Line Driver Circuit (5 pages)
2964	HS-3282	CMOS ARINC Bus Interface Circuit (13 pages)
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3019	ICM7170	µP-Compatible Real-Time Clock (13 pages)
1106	MWS5101, MWS5101A	256-Word x 4-Bit LSI Static RAM (5 pages)
1325	MWS5114	1025-Word x 4-Bit LSI Static RAM (4 pages)
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9109	AN109	82C59A Priority Interrupt Controller (14 pages)
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9112	AN112	80C286/80386 Hardware Com parison (4 pages)
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9400	AN400	Using The HS-3282 ARINC Bus Interface Circuit (6 pages)

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97197	AN7197	Keyless Entry System Using the CDP6805F2 8-Bit Microcomput er Unit (10 pages)
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97275	AN7275	User's Guide To The CDP1879 and CDP1879C1 CMOS Real-Time Clocks (18 pages)

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98633	AN8633	Versatile Serial Peripheral Interface (8 pages)
98723	AN8723	Interfacing Serial EEPROMs to CDP6805 Microcomputers (8 pages)
98756	AN8756	A Comparative Description of the UART - Universal Asynchronous Receiver/Transmitter (17 pages)
98759	AN8759	Low Cost Data Acquisition System Features SPI A/D Converter (9 pages)
98761	AN8761	User's Guide to the CDP68HC68T1 Real-Time Clock (14 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
27007	BR007	Complete Listing of Harris Sales Offices, Representatives and Authorized Distributors World Wide (7 pages)
7031	-	Harris Semiconductor Part Number Nomenclature Guide (16 pages)
POWER PACKAGING INFORMATION		
7017	DB304, Section 13	Intelligent Power Packaging Information (19 pages)
7018	DB309, DB223, DB220	MCT, MOSFET and Bipolar Power Packaging Information (31 pages)
POWER DATA SHEETS		
2093	1N4245, 1N4246, 1N4247, 1N4248, 1N4249	1A, 200V - 1000V Diodes (3 pages)
2176	1N5059, 1N5060, 1N5061, 1N5062	1A, 200V - 800V Diodes (3 pages)
2181	1N5624, 1N5625, 1N5626, 1N5627	3A, 200V - 800V Diodes (3 pages)
2297	2N6975, 2N6976, 2N6977, 2N6978	5A, 400V and 500V N-Channel IGBTs (4 pages)
2492	AS Series	High Energy Metal-Oxide Varistor for Arrester Applications (3 pages)
3387	Automotive AUML Series	Multilayer Transient Surface Mount Surge Suppressors (8 pages)
2183	BA/BB Series	Industrial High Energy Metal-Oxide Varistors (4 pages)
3540	"C" III Series	Radial Lead Metal-Oxide Varistors for the TVSS Environment (8 pages)
2187	CA Series	Industrial High Energy Metal-Oxide Disc Varistors (5 pages)
2186	CH Series	Surface Mount Metal-Oxide Varistors (4 pages)
2188	CP Series	Connector Pin Metal-Oxide Varistors (5 pages)
2972	CS Series	Connector Pin Metal-Oxide Varistors (3 pages)
2189	DA/DB Series	Industrial High Energy Metal-Oxide Varistors (4 pages)
2097	DB1 Series	1A, 50V - 1000V Single-Phase Full-Wave Bridge Rectifiers (3 pages)
2973	HA Series	Industrial High Energy Metal-Oxide Varistors (4 pages)
2190	LA Series	UL Recognized Radial Lead Metal-Oxide Varistors for Line Voltage Operation (8 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
2191	MA Series	Axial Lead Metal-Oxide Varistors (5 pages)
2461	ML Series	Multilayer Surface Mount Transient Surge Suppressors (9 pages)
2825	NA Series	Industrial High-Energy Metal-Oxide Varistors (4 pages)
2192	PA Series	Base Mount Metal-Oxide Varistors (4 pages)
2193	RA Series	Low Profile Radial Lead Metal-Oxide Varistors (7 pages)
2184	ZA Series	Radial Lead Metal-Oxide Varistors for Low-to-Medium Voltage Operation (11 pages)
2178	A14A, A14C, A14E, A14F, A14P	1A, 50V - 1000V Diodes (3 pages)
2175	A15A, A15F	3A, 50V - 100V Diodes (3 pages)
2179	A114 Series	1A, 50V - 600V Diodes (3 pages)
2180	A115 Series	3A, 50V - 600V Diodes (3 pages)
2164	A214 Series	2A, 50V - 200V Ultrafast Diodes (3 pages)
2163	A315 Series	3A, 50V - 200V Ultrafast Diodes (3 pages)
1412	BYW51-100, BYW51-150, BYW51-200	8A, 100V - 200V Ultrafast Dual Diodes (3 pages)
788	CA723, CA723C	Voltage Regulators Adjustable from 2V to 37V at Output Currents Up to 150mA Without External Pass Transistors (8 pages)
1785	CA1523	Voltage Regulator Control Circuit for Variable Switching Regulator (5 pages)
1239	CA1524, CA2524, CA3524	Regulating Pulse Width Modulator (15 pages)
339	CA3020	Multipurpose Wide-Band Power Amps Military, Industrial and Commercial Equipment at Frequency Up to 8MHz (8 pages)
490	CA3059, CA3079	Zero-Voltage Switches for 50Hz-60Hz and 400Hz Thyristor Control Applications (12 pages)
491	CA3085, CA3085A, CA3085B	Positive Voltage Regulators from 1.7V to 46V at Currents Up to 100mA (8 pages)
598	CA3094	Programmable Power Switch/ Amplifier for Control and General Purpose Applications (14 pages)
860	CA3126	TV Chroma Processor (9 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
1278	CA3165	Electronic Switching Circuit (6 pages)
1277	CA3169	Solenoid and Motor Driver (1/2 H Driver) (5 pages)
1436	CA3228	Speed Control System with Memory (9 pages)
1561	CA3242	Quad-Gated Inverting Power Driver For Interfacing Low-Level Logic to High Current Load (4 pages)
1836	CA3262A, CA3262	Quad-Gated Inverting Power Drivers (6 pages)
2223	CA3272, CA3272A, CA3292A	Quad-Gated Inverting Power Drivers with Fault Mode Diagnostic Flag Output (8 pages) FN2223.5
2113	CA3273	High-Side Driver (3 pages)
2222	CA3274	Current Limiting Power Switch with Current Limiter Sense Flag (4 pages)
2159	CA3275	Dual Full Bridge Driver (4 pages)
2792	CA3277	Dual 5V Regulator with Serial Data Buffer Interface for Microcontroller Applications (8 pages)
2767	CA3282	Octal Low Side Power Driver with Serial Bus Control (10 pages)
1049	CA3290	BiMOS Dual Voltage Comparator with MOSFET Input, Bipolar Output (8 pages)
2946	CA3292	Quad-Gated Inverting Power Driver With Fault Mode Diagnostic Flag Output (3 pages)
1918	CDP68HC68S1	Serial Bus Interface (14 pages)
2161	GE1001, GE1002, GE1003, GE1004	1A, 50V - 200V Ultrafast Diodes (3 pages)
2165	GE1101, GE1102, GE1103, GE1104	2.5A, 50V - 200V Ultrafast Diodes (3 pages)
2166	GE1301, GE1302, GE1303, GE1304	6A, 50V - 200V Ultrafast Diodes (3 pages)
2177	GER4001 thru GER4007	1A, 50V - 1000V Diodes (3 pages)
2833	HGTA32N60E2	32A, 600V N-Channel IGBT (4 pages)
2326	HGTB12N60D1C	12A, 600V Current Sensing N-Channel IGBT (4 pages)
3632	HGT1E50N60E2HB	600V/50A IGBT and Diode Half Bridge Module (7 pages)
2413	HGTD6N40E1, HGTD6N40E1S, HGTD6N50E1, HGTD6N50E1S	6A, 400V and 500V N-Channel IGBTs (4 pages)
3649	HGTD8P50G1, HGTD8P50G1S	8A, 500V P-Channel IGBT (8 pages)
2425	HGTD10N40F1, HGTD10N40F1S, HGTD10N50F1, HGTD10N50F1S	10A, 400V and 500V N-Channel IGBTs (4 pages)
2800	HGTG12N60D1D	12A, 600V N-Channel IGBT with Anti-Parallel Ultrafast Diode (4 pages)
2796	HGTG20N50C1D	20A, 500V N-Channel IGBT with Anti-Parallel Ultrafast Diode (5 pages)
3739	HGTG20N60B3D	40A, 600V, UFS Series N-Channel IGBT with Anti-Parallel Hyperfast Diode (7 pages) FN3739.2
2826	HGTG20N100D2	20A, 1000V N-Channel IGBT (5 pages)
3370	HGTG20N120E2	34A, 1200V N-Channel IGBT (5 pages)
2831	HGTG24N60D1	24A, 600V N-Channel IGBT (4 pages)
2797	HGTG24N60D1D	24A, 600V N-Channel IGBT with Anti-Parallel Ultrafast Diode (4 pages)
2834	HGTG30N120D2	30A, 1200V N-Channel IGBT (5 pages)
2828	HGTG32N60E2	32A, 600V N-Channel IGBT (4 pages)
2827	HGTG34N100E2	34A, 1000V N-Channel IGBT (5 pages)
1697	HGTH12N40C1, 40E1, 50C1, 50E1, HGTM12N40C1, 40E1, 50C1, 50E1, HGTP10N40C1, 40E1, 50C1, 50E1	10A, 12A, 400V and 500V N-Channel IGBTs (5 pages)
2273	HGTH12N40C1D, HGTH12N40E1D, HGTH12N50C1D, HGTH12N50E1D	12A, 400V and 500V N-Channel IGBTs with Anti-parallel Ultrafast Diodes (5 pages)
2174	HGTH20N40C1, 40E1, 50C1, 50E1, HGTM20N40C1, 40E1, 50C1, 50E1, HGTP20N40C1, 40E1, 50C1, 50E1	15A, 20A, 400V and 500V N-Channel IGBTs (5 pages)
2271	HGTH20N40C1D, HGTH20N40E1D, HGTH20N50C1D, HGTH20N50E1D	20A, 400V and 500V N-Channel IGBTs with Anti-Parallel Ultrafast Diodes (5 pages)

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Discrete and Intelligent Power Product Listing

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
2829	HGTM12N60D1	12A, 600V N-Channel IGBT (4 pages)
2832	HGTM24N60D1	24A, 600V N-Channel IGBT (4 pages)
2795	HGTP6N40E1D, HGTP6N50E1D	6A, 400V and 500V N-Channel IGBTs with Anti-Parallel Ultrafast Diodes (5 pages)
2405	HGTP10N40C1D, HGTP10N40E1D, HGTP10N50C1D, HGTP10N50E1D	10A, 400V and 500V N-Channel IGBTs with Anti-Parallel Ultra-Fast Diodes (5 pages)
2751	HGTP10N40F1D, HGTP10N50F1D	10A, 400V and 500V N-Channel IGBTs with Anti-Parallel Ultrafast Diodes (5 pages)
2830	HGTP12N60D1	12A, 600V N-Channel IGBT (4 pages)
3407	HGTP14N40F3VL	14A, 400V N-Channel, Voltage Clamping IGBT (5 pages)
3723	HGTP20N60B3	40A, 600V, UFS Series N-Channel IGBT (7 pages)
3982	HIP0061	60V, 3.5A, 3-Transistor Common-Source ESD Protected Power MOSFET Array (7 pages)
3018	HIP0080, HIP0081	Quad Inverting Power Drivers with Serial Diagnostic Interface (8 pages)
3643	HIP0082	Quad Power Driver with Serial Diagnostic Interface (7 pages) FN3643.2
2788	HIP1030	1A High Side Driver with Overload Protection (5 pages)
3596	HIP1031	Half Amp High Side Driver with Overload Protection (4 pages)
3398	HIP1090	Protected High Side Power Switch with Transient Suppression (5 pages)
3691	HIP2030	30V MCT/IGBT Gate Driver (10 pages)
3918	HIP2030EVAL	Isolated MCT/IGBT Gate Driver Evaluation Board (4 pages)
2801	HIP2500	Half Bridge 500V_{DC} Driver (9 pages)
2939	HIP4011	Three Phase Brushless DC Motor Controller (3 pages)
3178	HIP4080	80V/2.5A Peak, High Frequency Full Bridge FET Driver (16 pages) FN3178.9
3658	HIP4080A	80V/2.5A Peak, High Frequency Full Bridge FET Driver (15 pages)
4018	HIP4080AEVAL2	200W Digital Audio Amplifier Evaluation Board for HIP4080A (3 pages) FN4018
3556	HIP4081	80V/2.5A Peak, High Frequency Full Bridge FET Driver (15 pages) FN3556.6
3659	HIP4081A	80V/2.5A Peak, High Frequency Full Bridge FET Driver (15 pages)
3676	HIP4082	80V, 1.25A Peak Current H-Bridge FET Driver (11 pages) FN3676.1
3207	HIP5060	Power Control IC Single Chip Power Supply (6 pages)
3390	HIP5061	7A, High Efficiency Current Mode Controlled PWM Regulator (20 pages)
3208	HIP5062	Power Control IC Single Chip Dual Switching Power Supply (7 pages)
3209	HIP5063	Power Control IC Single Chip Power Supply (4 pages)
3210	HIP5500	High Voltage IC Half Bridge Gate Driver (10 pages)
3270	HIP5600	Thermally Protected High Voltage Linear Regulator (15 pages)
3747	HIP5600EVAL1	High Voltage DC to DC Evaluation Board for HIP5600, Operates from 50VDC to 400VDC (2 pages)
3748	HIP5600EVAL2	High Voltage AC to DC Evaluation Board for HIP5600, Operates from 80V_{RMS} to 132V_{RMS} (2 pages)
3749	HIP5600EVAL3	High Voltage AC to DC Evaluation Board for HIP5600, Operates from 80V_{RMS} to 320V_{RMS} (2 pages)
3644	HIP7010	J1850 Byte Level Interface Circuit (16 pages)
3642	HIP7020	J1850 Bus Transceiver I/O for Multiplex Wiring (7 pages)
3645	HIP7030A0	J1850 8-Bit 68HC05 Microcontroller Emulator Version (10 pages)
3646	HIP7030A2	J1850 8-Bit 68HC05 Microcontroller (49 pages)
3647	HIP7038A8	J1850 8-Bit 68HC05 Microcontroller 8K EEPROM Version (4 pages)
3601	HIP9010	Engine Knock Signal Processor (10 pages)
2790	HIP9020	Programmable Quad Buffer with Pre and Post Scaler Dividers (3 pages)
2942	HRP2540	Power Rectifier/Power Surge Suppressor (4 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
2850	HV400	High Current MOSFET Driver (10 pages)
3584	HV400MJ/883	High Current MOSFET Driver (10 pages)
2487	HV-2405E	World-Wide Single Chip Power Supply (14 pages)
3072	ICL7660	CMOS Voltage Converter (9 pages)
3179	ICL7660S	Super Voltage Converter (10 pages)
3181	ICL7662	CMOS Voltage Converter (10 pages)
3180	ICL7663S	CMOS Programmable Micropower Positive Voltage Regulator (7 pages)
3182	ICL7665S	CMOS Micropower Over/Under Voltage Detector (10 pages)
2853	ICL7667	Dual Power MOSFET Driver (7 pages)
3183	ICL7673	Automatic Battery Back-Up Switch (6 pages)
3184	ICL8211, ICL8212	Programmable Voltage Detectors (14 pages)
2319	IRFP350/351/352/353, IRFP350R/351R/352R/353R	N-Channel Power MOSFETs Avalanche Energy Rated (6 pages)
3372	IRFR410, IRFU410	1.5A 500V Avalanche Energy Rated N-Channel Enhancement Mode Power MOSFETs (8 pages)
4001	IRFU9110, IRFR9110	3.1A, 100V, Avalanche Rated, P-Channel Enhancement-Mode Power MOSFETs (8 pages) FN4001
3987	IRFU9120, IRFR9120	5.6A, 100V, Avalanche Rated, P-Channel Enhancement-Mode Power MOSFETs (7 pages)
3602	MCTG35P60F1	35A, 600V P-Type MOS Controlled Thyristor (MCT) (5 pages)
3694	MCTV35P60F1D	35A, 600V P-Type MOS Controlled Thyristor (MCT) with Anti-Parallel Diode (6 pages) FN3694.1
3516	MCTV65P100F1, MCTA65P100F1	65A, 1000V P-Type MOS Controlled Thyristor (MCT) (7 pages)
3374	MCTV75P60E1, MCTA75P60E1	75A, 600V P-Type MOS Controlled Thyristor (MCT) (7 pages)
1355	MUR810, RURP810, MUR815, RURP815, MUR820, RURP820	8A, 100V - 200V Ultrafast Diodes (2 pages)
2091	MUR840, RURP840, MUR850, RURP850, MUR860, RURP860	8A, 400V - 600V Ultrafast Diodes (3 pages)
2780	MUR870E, MUR880E, MUR890E, MUR8100E, RURP870, RURP880, RURP890, RURP8100	8A, 700V - 1000V Ultrafast Diodes (3 pages)
2779	MUR1510, RURP1510, MUR1515, RURP1515, MUR1520, RURP1520	8A, 400V - 600V Ultrafast Diodes (3 pages)
2778	MUR1540, RURP1540, MUR1550, RURP1550, MUR1560, RURP1560	15A, 400V - 600V Ultrafast Diodes (3 pages)
1885	MUR1610CT, MUR1615CT, MUR1620CT	16A, 100V - 200V Ultrafast Dual Diodes (5 pages)
2775	MUR3010PT, RURH1510CC, MUR3015PT, RURH1515CC, MUR3020PT, RURH1520CC	15A, 100V - 200V Ultrafast Dual Diodes (3 pages)
2774	MUR3040PT, RURH1540CC, MUR3050PT, RURH1550CC, MUR3060PT, RURH1560CC	15A, 400V - 600V Ultrafast Dual Diodes (3 pages)
3532	PCF8P05W, PCF8P05D	P-Channel MOS Chip (2 pages)
3536	PCF8N20W, PCF8N20D	N-Channel MOS Chip (2 pages)
3517	PCF10N15W, PCF10N15D	N-Channel MOS Chip (2 pages)
3520	PCF12N06RLEW, PCF12N06LED	N-Channel MOS Chip (2 pages)
3537	PCF12N10W, PCF12N10D	N-Channel MOS Chip (2 pages)
3526	PCF12P10W, PCF12P10D	P-Channel MOS Chip (2 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
3535	PCF14N05W, PCF14N05D	N-Channel MOS Chip (2 pages)
3521	PCF14N05LW, PCF14N05LD	N-Channel MOS Chip (2 pages)
3519	PCF15P05W, PCF15P05D	P-Channel MOS Chip (2 pages)
3518	PCF15N06W, PCF15N06D	N-Channel MOS Chip (2 pages)
3538	PCF15N06LW, PCF15N06LD	N-Channel MOS Chip (2 pages)
3534	PCF25N05W, PCF25N05D	N-Channel MOS Chip (2 pages)
3533	PCF50N05W, PCF50N05D	N-Channel MOS Chip (2 pages)
3528	PCF110W, PCF110D	N-Channel MOS Chip (2 pages)
3523	PCF130W, PCF130D	N-Channel MOS Chip (2 pages)
3539	PCF140W, PCF140D	N-Channel MOS Chip (2 pages)
3527	PCF210W, PCF210D	N-Channel MOS Chip (2 pages)
3524	PCF230W, PCF230D	N-Channel MOS Chip (2 pages)
3525	PCF240W, PCF240D	N-Channel MOS Chip (2 pages)
3522	PCF420W, PCF420D	N-Channel MOS Chip (2 pages)
3531	PCF440W, PCF440D	N-Channel MOS Chip (2 pages)
3529	PCF450W, PCF450D	N-Channel MOS Chip (2 pages)
3530	PCFC40W, PCFC40D	N-Channel MOS Chip (2 pages)
3986	RF1K49086	3.5A, 30V, Avalanche Rated, Dual N-Channel Enhancement-Mode Power MOSFET (7 pages) FN3986.1
3952	RF1K49088	3.5A, 30V, Avalanche Rated, Logic Level, Dual N-Channel Enhancement-Mode Power MOSFETs (MegaFETs) (8 pages) FN3952.1
3985	RF1K49090	3.5A, 12V, Avalanche Rated, Logic Level, Dual N-Channel Enhancement-Mode Power MOSFET (MegaFET) (8 pages) FN3985.2
3968	RF1K49092	3.5A/2.5A, 12V, Avalanche Rated, Logic Level, Complementary Enhancement-Mode Power MOSFET (MegaFET) (13 pages) FN3968.1
3969	RF1K49093	2.5A, 12V, Avalanche Rated, Logic Level, Dual P-Channel Enhancement-Mode Power MOSFET (MegaFET) (8 pages) FN3969.1
4011	RF1K49156	6.3A, 30V, Avalanche Rated, Logic Level, Single N-Channel Enhancement-Mode Power MOSFET (8 pages) FN4011
2869	RFA100N05E	N-Channel Enhancement-Mode Power Field-Effect Transistor (MegaFET) (6 pages)
2430	RFB18N10CS	Current Sensing N-Channel Enhancement-Mode Power Field-Effect Transistor (6 pages)
3598	RFD7N10LE, RFD7N10LESM, RFP7N10LE	7A, 100V, ESD Rated, Avalanche Rated, Logic Level N-Channel Enhancement-Mode Power MOSFETs (MegaFETs) (8 pages)
3937	RFD8P06E, RFD8P06ESM, RFP8P06E	8A, 60V, ESD Rated, Avalanche Rated, P-Channel Enhancement-Mode Power MOSFETs (MegaFETs) (8 pages) FN3937.2
3515	RFD10P03L, RFD10P03LSM, RFD10P03L	10A, -30V Avalanche Rated, Logic Level P-Channel Enhancement-Mode Power MOSFETs (MegaFETs) (9 pages)
2268	RFD14N05, RFD14N05SM, RFP14N05	14A, 50V, Avalanche Rated N-Channel Enhancement-Mode Power MOSFETs (MegaFETs) (8 pages) FN2268.2
4002	RFD14N06, RFD14N06SM, RFP14N06	14A, 60V, Avalanche Rated N-Channel Enhancement-Mode Power MOSFETs (MegaFETs) (8 pages) FN4002
2387	RFD15P05, RFD15P05SM, RFP15P05	15A, 50V, Avalanche Rated, P-Channel Enhancement-Mode Power MOSFET (MegaFET) (8 pages) FN2387.2
3988	RFD15P06, RFD15P06SM, RFP15P06	15A, 60V, Avalanche Rated, P-Channel Enhancement-Mode Power MOSFET (MegaFET) (8 pages)
2267	RFD16N05, RFD16N05SM	16A, 50V, Avalanche Rated N-Channel Enhancement-Mode Power MOSFETs (MegaFETs) (8 pages) FN2267.2

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3628	RFD16N06LE, RFD16N06LESM	16A, 60V, ESD Rated, Avalanche Rated, Logic Level N-Channel Enhancement-Mode Power MOSFETs (MegaFETs) (8 pages)
3648	RFD3055, RFD3055SM, RFP3055	12A, 60V, Avalanche Rated, N-Channel Enhancement-Mode Power MOSFETs (MegaFETs) (8 pages)
3975	RFF60P06	25A, 60V, Hermetically Packaged, Avalanche Rated P-Channel Enhancement-Mode Power MOSFET (MegaFET) (9 pages)
2436	RFG30P05, RFP30P05, RF1S30P05, RF1S30P05SM	30A, 50V, Avalanche Rated, P-Channel Enhancement-Mode Power MOSFETs (MegaFETs) (10 pages)
2437	RFG30P06, RFP30P06, RF1S30P06, RF1S30P06SM	30A, 60V, Avalanche Rated, P-Channel Enhancement-Mode Power MOSFETs (MegaFETs) (10 pages)
3574	RFG45N06, RFP45N06, RF1S45N06, RF1S45N06SM	45A, 60V, Avalanche Rated N-Channel Enhancement-Mode Power MOSFETs (MegaFETs) (10 pages)
3575	RFG50N06, RFP50N06, RF1S50N06, RF1S50N06SM	50A, 60V, Avalanche Rated N-Channel Enhancement-Mode Power MOSFETs (MegaFETs) (10 pages)
3951	RFG60P03, RFP60P03, RF1S60P03, RF1S60P03SM	60A, 30V, Avalanche Rated, P-Channel Enhancement-Mode Power MOSFETs (MegaFETs) (10 pages)
2745	RFG60P05E	60A, 50V, ESD Rated, Avalanche Rated, P-Channel Enhancement-Mode Power MOSFET (MegaFET) (7 pages) FN2745.3
3989	RFG60P06E	60A, 60V, ESD Rated, Avalanche Rated, P-Channel Enhancement-Mode Power MOSFETs (MegaFETs) (7 pages)
3206	RFG70N06, RFP70N06, RF1S70N06, RF1S70N06SM	70A, 60V, Avalanche Rated, N-Channel Enhancement-Mode Power MOSFETs (10 pages) FN3206.2
2275	RFG75N05E, RFH75N05E	N-Channel Enhancement-Mode Power Field-Effect Transistors (MegaFETs) (7 pages)
2112	RFP25N05	25A, 50V, Avalanche Rated N-Channel Enhancement-Mode Power MOSFET (MegaFET) (7 pages) FN2112.2
1492	RFP25N06, RF1S25N06, RF1S25N06SM	25A, 60V, Avalanche Rated N-Channel Enhancement-Mode Power MOSFETs (MegaFETs) (8 pages)
3629	RFP30N06LE	30A, 60V, ESD Rated, Avalanche Rated, Logic Level N-Channel Enhancement-Mode Power MOSFETs (MEgaFETs) (7 pages)
4005	RFP45N03L, RF1S45N03L, RF1S45N03LSM	45A, 30V, Avalanche Rated N-Channel Logic Level Enhancement-Mode Power MOSFETs (MegaFETs) (10 pages)
3404	RFP70N03, RF1S70N03, RF1S70N03SM	70A, 30V, Avalanche Rated N-Channel Enhancement-Mode Power MOSFETs (MegaFETs) (8 pages) FN3404.1
3377	RFV10N50BE	10A, 500V, Fast Switching N-Channel Enhancement-Mode Power MOSFETs (8 pages)
3613	RHRD440, RHRD450, RHRD460, RHRD440S, RHRD450S, RHRD460S	4A, 400V - 600V Hyperfast Diodes (6 pages)
3746	RHRD640, RHRD650, RHRD660, RHRD640S, RHRD650S, RHRD660S	6A, 400V - 600V Hyperfast Diodes (6 pages)
3626	RHRD4120, RHRD4120S	4A, 1200V Hyperfast Diodes (6 pages)
3981	RHRD6120, RHRD6120S	6A, 1200V Hyperfast Diode (6 pages)
3684	RHRG1540CC, RHRG1550CC, RHRG1560CC	15A, 400V - 600V Hyperfast Dual Diodes (5 pages)
3693	RHRG1570CC, RHRG1580CC, RHRG1590CC, RHRG15100CC	15A, 700V - 1000V Hyperfase Dual Diodes (5 pages)
3686	RHRG15120CC	15A, 1200V Hyperfast Dual Diode (5 pages)
3938	RHRG3040, RHRG3050, RHRG3060	30A, 400V - 600V Hyperfast Diodes (5 pages)
3939	RHRG3040CC, RHRG3050CC, RHRG3060CC	30A, 400V - 600V Hyperfast Dual Diodes (5 pages)
3941	RHRG3070, RHRG3080, RHRG3090, RHRG30100	30A, 700V - 1000V Hyperfast Diodes (5 pages)

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3942	RHRG3070CC, RHRG3080CC, RHRG3090CC, RHRG30100CC	30A, 700V - 1000V Hyperfast Dual Diodes (5 pages)
3410	RHRG30120	30A, 1200V Hyperfast Diode (3 pages)
3411	RHRG30120CC	30A, 1200V Hyperfast Dual Diode (3 pages)
3920	RHRG5040, RHRG5050, RHRG5060	50A, 400V - 600V Hyperfast Diodes (5 pages)
3106	RHRG5070, RHRG5080, RHRG5090, RHRG50100	50A, 700V - 1000V Hyperfast Diodes (3 pages)
3947	RHRG50120	50A, 1200V Hyperfast Diode (5 pages)
3944	RHRG7540, RHRG7550, RHRG7560	75A, 400V - 600V Hyperfast Diodes (5 pages)
3923	RHRG7570, RHRG7580, RHRG7590, RHRG75100	75A, 700V - 1000V Hypefast Diode (5 pages)
3414	RHRG75120	75A, 1200V Hyperfast Diode (3 pages)
3668	RHRP840, RHRP850, RHRP860	8A, 400V - 600V Hyperfast Diodes (5 pages)
3964	RHRP840CC, RHRP850CC, RHRP860CC	8A, 400V - 600V Hyperfast Dual Diodes (5 pages)
3667	RHRP870, RHRP880, RHRP890, RHRP8100	8A, 700V - 1000V Hyperfast Diodes (5 pages)
3965	RHRP870CC, RHRP880CC, RHRP890CC, RHRP8100CC	8A, 700V - 1000V Hyperfast Dual Diodes (5 pages)
3685	RHRP1540, RHRP1550, RHRP1560	15A, 400V - 600V Hyperfast Diodes (5 pages)
3692	RHRP1570, RHRP1580, RHRP1590, RHRP15100	15A, 700V - 1000V Hyperfast Diodes (5 pages)
3933	RHRP3040, RHRP3050, RHRP3060	30A, 400V - 600V Hyperfast Diodes (5 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
3940	RHRP3070, RHRP3080, RHRP3090, RHRP30100	30A, 700V - 1000V Hyperfast Diodes (5 pages)
3660	RHRP8120	8A, 1200V Hyperfase Diode (5 pages)
3966	RHRP8120CC	8A, 1200V Hyperfast Dual Diode (5 pages)
3677	RHRP15120	15A, 1200V Hyperfast Diode (5 pages)
3409	RHRP30120	30A, 1200V Hyperfast Diode (3 pages)
3919	RHRU5040, RHRU5050, RHRU5060	50A, 400V - 600V Hyperfast Diodes (5 pages)
3665	RHRU5070, RHRU5080, RHRU5090, RHRU50100	50A, 700V - 1000V Hyperfast Diodes (5 pages)
3945	RHRU7540, RHRU7550, RHRU7560	75A, 400V - 600V Hyperfast Diodes (5 pages)
3925	RHRU7570, RHRU7580, RHRU7590, RHRU75100	75A, 700V - 1000V Hyperfast Diode (5 pages)
3572	RHRU10040, RHRU10050, RHRU10060	100A, 400V - 600V Hyperfast Diodes (3 pages)
3089	RHRU15040, RHRU15050, RHRU15060	150A, 400V - 600V Hyperfast Diodes (3 pages)
3589	RHRU15090, RHRU150100	150A, 900V - 1000V Hyperfast Diodes (3 pages)
3946	RHRU50120	50A, 1200V Hyperfast Diode (5 pages)
3408	RHRU75120	75A, 1200V Hyperfast Diode (3 pages)
3145	RHRU100120	100A, 1200V Hyperfast Diode (3 pages)
3948	RLD03N06CLE, RLD03N06CLESM, RLP03N06CLE	0.3A, 60V, ESD Rated, Current Limited, Voltage Clamped Logic Level N-Channel Enhancement-Mode Power MOSFETs (12 pages) FN3948.1
3614	RURD410, RURD415, RURD420, RURD410S, RURD415S, RURD420S	4A, 100V - 200V Ultrafast Diodes (6 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
3140	RURD440, RURD450, RURD460, RURD440S, RURD450S, RURD460S	4A, 400V - 600V Ultrafast Diodes (6 pages)
3640	RURD610, RURD615, RURD620, RURD610S, RURD615S, RURD620S	6A, 100V - 200V Ultrafast Diodes (6 pages)
3750	RURD640, RURD650, RURD660, RURD640S, RURD650S, RURD660S	6A, 400V - 600V Ultrafast Diodes (6 pages)
3641	RURD4120, RURD4120S	4A, 1200V Ultrafast Diodes (6 pages)
3962	RURD6120, RURD6120S	6A, 1200V Ultrafast Diode (6 pages)
3277	RURG3010, RURG3015, RURG3020	30A, 100V - 200V Ultrafast Diodes (3 pages)
3212	RURG3040, RURG3050, RURG3060	30A, 400V - 600V Ultrafast Diodes (3 pages)
3213	RURG3070, RURG3080, RURG3090, RURG30100	30A, 700V-1000V Ultrafast Diodes (3 pages)
3211	RURG5040, RURG5050, RURG5060	50A, 400V-600V Ultrafast Diode (3 pages)
3276	RURG5070, RURG5080, RURG5090, RURG50100	50A, 700V-1000V Ultrafast Diode (3 pages)
3388	RURG8040, RURG8050, RURG8060	80A, 400V - 600V, Ultrafast Diodes (3 pages)
3371	RURG8070, RURG8080, RURG8090, RURG80100	80A, 700V - 1000V Ultrafast Diode (3 pages)
3551	RURG1510CC, RURG1515CC, RURG1520CC	15A, 100V - 200V Ultrafast Dual Diodes (3 pages)
3548	RURG1540CC, RURG1550CC, RURG1560CC	15A, 400V - 600V Ultrafast Dual Diodes (3 pages)
3552	RURG3010CC, RURG3015CC, RURG3020CC	30A, 100V - 200V Ultrafast Dual Diodes (3 pages)
3549	RURG3040CC, RURG3050CC, RURG3060CC	30A, 400V - 600V Ultrafast Dual Diodes (3 pages)
2933	RURG1570CC, RURG1580CC, RURG1590CC, RURG15100CC	15A, 700V - 1000V Dual Ultrafast Diodes (3 pages)
3695	RURG15120CC	15A, 1200V Ultrafast Dual Diode (5 pages)
2935	RURG3070CC, RURG3080CC, RURG3090CC, RURG30100CC	30A, 700V - 1000V Ultrafast Dual Diodes (3 pages)
3399	RURG30120	30A, 1200V Ultrafast Diode (3 pages)
3400	RURG30120CC	30A, 1200V Ultrafast Dual Diode (3 pages)
3740	RURG50120	50A, 1200V Ultrafast Diode (5 pages)
3412	RURG75120	75A, 1200V Ultrafast Diode (3 pages)
2934	RURH1570CC, RURH1580CC, RURH1590CC, RURH15100CC	15A, 700V - 1000V Ultrafast Dual Diodes (3 pages)
2773	RURH3010CC, RURH3015CC, RURH3020CC	30A, 100V - 200V Ultrafast Dual Diodes (3 pages)
2772	RURH3040CC, RURH3050CC, RURH3060CC	30A, 400V - 600V Ultrafast Dual Diodes (3 pages)
2932	RURH3070CC, RURH3080CC, RURH3090CC, RURH30100CC	30A, 700V - 1000V Ultrafast Dual Diodes (3 pages)
1383	RURM1610CC, RURM1615CC, RURM1620CC	16A, 100V - 200V Ultrafast Dual Diodes (2 pages)
1356	RURP810CC, RURP815CC, RURP820CC	8A, 100V - 200V Ultrafast Dual Diodes (2 pages)
2878	RURP1570, RURP1580, RURP1590, RURP15100	15A, 700V - 1000V Ultrafast Diodes (3 pages)
2777	RURP3010, RURP3015, RURP3020	30A, 100V - 200V Ultrafast Diodes (3 pages)

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AnswerFAX Technical Support
Discrete and Intelligent Power Product Listing

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
2776	RURP3040, RURP3050, RURP3060	30A, 400V - 600V Ultrafast Diodes (3 pages)
2877	RURP3070, RURP3080, RURP3090, RURP30100	30A, 700V - 1000V Ultrafast Diodes (3 pages)
3661	RURP8120	8A, 1200V Ultrafast Diode (5 pages)
3696	RURP15120	15A, 1200V Ultrafast Diode (5 pages)
3397	RURP30120	30A, 1200V Ultrafast Diode (3 pages)
2940	RURU5040, RURU5050, RURU5060	50A, 400V - 600V Ultrafast Diodes (3 pages)
3376	RURU5070, RURU5080, RURU5090, RURU50100	50A, 700V - 1000V Ultrafast Diodes (3 pages)
3380	RURU8040, RURU8050, RURU8060	80A, 400V - 600V Ultrafast Diodes (3 pages)
3375	RURU8070, RURU8080, RURU8090, RURU80100	80A, 700V - 1000V Ultrafast Diodes (3 pages)
3546	RURU10040, RURU10050, RURU10060	100A, 400 - 600V Ultrafast Diodes (3 pages)
3201	RURU15040, RURU15050, RURU15060	150A, 400V - 600V Ultrafast Diodes (3 pages)
3202	RURU15070, RURU15080, RURU15090, RURU150100	150A, 700V - 1000V Ultrafast Diodes (3 pages)
3741	RURU50120	50A, 1200V Ultrafast Diode (5 pages)
3413	RURU75120	75A, 1200V Ultrafast Diode (3 pages)
3545	RURU100120	100A, 1200V Ultrafast Diode (3 pages)
1692	SGT03U13, SGT06U13, SGT23U13	Unidirectional Transient Surge Suppressors (SURGECTOR™) (3 pages)
1691	SGT10S10, SGT27S10	Gate Controlled Unidirectional Transient Surge Suppressors (4 pages)
1895	SGT21B13, 3A, SGT22B13, 13A, SGT23B13, 13A, SGT27B13, 13A, SGT27B13B	Bidirectional Transient Surge Suppressors (4 pages)
3603	SGT23B27, SGT27B27 SGT27B27A, 27B	Bidirectional Transient Surge Suppressors (4 pages)
2762	SGT27S23	Gate Controlled Unidirectional Transient Surge Suppressor (SURGECTOR™) (3 pages)
2428	SP600	Half Bridge 500V_{DC} Driver (7 pages)
2429	SP601	Half Bridge 500V_{DC} Driver (7 pages)
2789	SP710	Protected Power Switch with Transient Suppression (2 pages)
2791	SP720	Electronic Protection Array for ESD and Over-Voltage Protection (5 pages) FN2791.6
3683	SP720MD-8, SP720MD, SP720MM-8, SP720MM	High Reliability Electronic Protection Array for ESD and Overvoltage Protection (6 pages)
3590	SP721	Electronic Protection Array for ESD and Over-Voltage Protection (5 pages) FN3590.2
POWER LINE CARDS		
523268	LC-3268.3	Harris Hyper-Fast Recovery Rectifier Product Line (2 pages)
521462	LC-1462.5	Harris Ultra-Fast Recovery Rectifier Product Line (2 pages)
POWER RELIABILITY REPORTS		
77001	RR001	High Voltage Integrated Circuit (HVIC) Reliability Qualification (4 pages)
77002	RR002	Concurrent Design, Test and Reliability Engineering of Power ASICs (7 pages)
POWER TECH BRIEFS		
82304	TB304	Advanced Power Package Construction Method Raises TO-252 Reliability to New Heights (3 pages)
82320	TB320	SP720/SP721 CMOS Protection Model and Other Data (5 pages)
82321	TB321	HIP4080 and HIP4081 High Frequency H-Bridge Drivers (2 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
INTRODUCTION TO THE MCT USER'S GUIDE		
7005	DB309	Introduction, MCT Description, MCT Equivalent Circuits Models, Characteristics, Gate Circuits, Applications, Comparison on MCT and IGBT, Outlook What's Ahead for MCTs, and MCT Reference List and Bibliography (37 pages)
TRANSIENT VOLTAGE SUPPRESSION		
7053	DB450C	Voltage Transients - An Overview (16 pages)
7054	DB450C	Transient Suppression - Devices and Principles (18 pages)
7055	DB450C	Varistors - Basic Properties, Terminology and Theory (17 pages)
7056	DB450C	Designing with Varistors (26 pages)
7057	DB450C	Suppression - Telecommunications Systems (14 pages)
7058	DB450C	Suppression - Automative Transients (6 pages)
7059	DB450C	Varistor Testing (17 pages)
7060	DB450C	Harris MOV Quality and Reliability (23 pages)
7061	DB450C	Varistor Products (10 pages)
7062	DB450C	High Reliability Series (8 pages)
POWER APPLICATION NOTES		
9027	AN027	Power Supply Design Using the ICL8211 and ICL8212 (8 pages)
9051	AN051	Principles and Applications of the ICL7660 CMOS Voltage Converter (10 pages)
95766	AN5766	Application of the CA3020 and CA3020A Multipurpose Wide-Band Power Amplifiers (8 pages)
96048	AN6048	Some Applications of a Programmable Power Switch/ amplifier (13 pages)
96157	AN6157	Applications of the CA3085 Series Monolithic IC Voltage Regulators (11 pages)
96182	AN6182	Features and Applications of Integrated Circuit Zero-Voltage Switches (CA3059 and CA3079) (31 pages)
96315	AN6315	COS/MOS Interfacing Simplified (7 pages)
96915	AN6915	Application of the CA1524 Series Pulse-Width Modulator ICs (18 pages)
97174	AN7174	The CA1524 Pulse-Width Modulator-Driver for an Electronic Scale (2 pages)
97244	AN7244	Understanding Power MOSFETs (4 pages)
97254	AN7254	Switching Waveforms of the L^2FET: a 5 Volt Gate-Drive Power MOSFET (8 pages)
97260	AN7260	Power MOSFET Switching Waveforms: A New Insight (7 pages)
97326	AN7326	Applications of the CA3228E Speed Control System (16 pages)
97332	AN7332	The Application of Conductivity-Modulated Field-Effect Transistors (5 pages)
98602	AN8602	The IGBTs - A New High Conductance MOS-Gated Device (3 pages)
98603	AN8603	Improved IGBTs with Fast Switching Speed and High-Current Capability (4 pages)
98610	AN8610	Spicing-Up Spice II Software for Power MOSFET Modeling (8 pages)
98614	AN8614	The CA1523 Variable Interval Pulse Regulator (VIPUR) for Switch Mode Power Supplies (13 pages)
98754	AN8754	Method of Measurement of Simultaneous Switching Transient (3 pages)
98820	AN8820	Recommendations for Soldering Terminal Leads to MOV Varistor Discs (2 pages)
98829	AN8829	SP600 and SP601 an HVIC MOSFET/IGT Driver for Half-Bridge Topologies (6 pages)
99002	AN9002	Transient Voltage Suppression in Automotive Vehicles (8 pages)
99003	AN9003	Low-Voltage Metal-Oxide Varistor - Protection for Low Voltage (≤5V) ICs (13 pages)
99010	AN9010	HIP2500 High Voltage ($500V_{DC}$) Half-Bridge Driver IC (8 pages)
99101	AN9101	High Current Off Line Power Supply (4 pages)
99105	AN9105	HVIC/IGBT Half-Bridge Converter Evaluation Circuit (1 page)
99108	AN9108	Harris Multilayer Surface Mount Surge Suppressors (10 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
99201	AN9201	Protection Circuits for Quad and Octal Low Side Power Drivers (9 pages)
99204	AN9204	Tools for Controlling Voltage Surges and Noise (4 pages)
99208	AN9208	High Frequency Power Converters (9 pages)
99209	AN9209	A Spice-2 Subcircuit Representation for Power MOSFETs, Using Empirical Methods (4 pages)
99210	AN9210	A New PSpice Subcircuit for the Power MOSFET Featuring Global Temperature Options (12 pages)
99211	AN9211	Soldering Recommendations for Surface Mount Metal Oxide Varistors and Multilayer Transient Voltage Suppressors (8 pages)
99212	AN9212	HIP5060 Family of Current Mode Control ICs Enhance 1MHz Regulator Performance (7 pages)
99217	AN9217	High Current Off Line Power Supply (11 pages)
99301	AN9301	High Current Logic Level MOSFET Driver (3 pages)
99302	AN9302	CA3277 Dual 5V Regulator Circuit Applications (9 pages)
99304	AN9304	ESD and Transient Protection Using the SP720 (10 pages)
99306	AN9306	The New "C" III Series of Metal Oxide Varistors (5 pages)
99307	AN9307	The Connector PIN Varistor for Transient Voltage Protection in Connectors (7 pages)
99308	AN9308	Voltage Transients and their Suppression (5 pages)
99310	AN9310	Surge Suppresion Technologies Advantages and Disadvantages (MOVs, SADs, Gas Tubes, Filters & Transforms) (6 pages)
99311	AN9311	The ABCs of MOVs (3 pages) AN9311.3
99312	AN9312	Suppression of Transients in an Automative Environment (11 pages)
99318	AN9318	Insulated-Gate Transistors Simplify AC-Motor Speed Contro (12 pages)
99319	AN9319	Parallel Operation of Insulated Gate Transistors (6 pages)
99320	AN9320	Parallel Operation of Semiconductor Switches (4 pages)
99321	AN9321	Single Pulse Unclamped Inductive Switching: A Rating System (5 pages)
99322	AN9322	A Combined Single Pulse and Repetitive UIS Rating System (4 pages)
99323	AN9323	HIP5061 High Efficiency, High Performance, High Power Converter (10 pages)
99324	AN9324	HIP4080, 80V High Frequency H-Bridge Driver (12 pages) AN9324.2
99325	AN9325	HIP4081, 80V High Frequency H-Bridge Driver (11 pages) AN9325.1
99335	AN9335	HIP5500 High Voltage ($500V_{DC}$) Power Supply Driver IC (13 pages)
99404	AN9404	HIP4080A, 80V High Frequency H-Bridge Driver (12 pages)
99405	AN9405	HIP4081A, 80V High Frequency H-Bridge Driver (11 pages)
99408	AN9408	The HIP2030 MCT/IGBT Gate Driver Provides Isolated Control Signals to Switch Power Devices (7 pages)
99409	AN9409	Safe Operating Area Testing Without a Heat Sink (4 pages)
99416	AN9416	Thermal Considerations In Power BiMOS Low Side Drivers (HIP0080, HIP0081, HIP0082, CA3282 and Others) (19 pages) AN9416.1
99417	AN9417	A 360W, Power Factor Corrected, Off-Line Power Supply, Using the HIP5500 (6 pages)
99506	AN9506	A 50W, 500kHz, Full-Bridge, Phase-Shift, ZVS Isolated DC to DC Converter Using the HIP4081A (16 pages)
797338	MMPWRDEV	Harris Power MOSFET and MCT Spice Model Library (71 pages) or Call Harris Semiconductor (407) 724-7237 and request by mail. MMPWRDEV.1

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
27007	BR007	Complete Listing of Harris Sales Offices, Representatives and Authorized Distributors World Wide (7 pages)
7031	-	Harris Semiconductor Part Number Nomenclature Guide (16 pages)
7023	-	64K CMOS PROM HS-6664RH Radiation Characterization Report (13 pages)
RADIATION HARDENED PACKAGING INFORMATION		
7021	DB235, Section 15	Radiation Hardened Packaging Information (17 pages)
RADIATION HARDENED DATA SHEETS		
3217	2N7271D, 2N7271R, 2N7271H	Radiation Hardened N-Channel Power MOSFETs (4 pages)
3218	2N7272D, 2N7272R, 2N7272H	Radiation Hardened N-Channel Power MOSFETs (4 pages)
3219	2N7273D, 2N7273R, 2N7273H	Radiation Hardened N-Channel Power MOSFETs (4 pages)
3249	2N7274D, 2N7274R, 2N7274H	Radiation Hardened N-Channel Power MOSFETs (5 pages)
3223	2N7275D, 2N7275R, 2N7275H	Radiation Hardened N-Channel Power MOSFETs (4 pages)
3224	2N7276D, 2N7276R, 2N7276H	Radiation Hardened N-Channel Power MOSFETs (4 pages)
3250	2N7277D, 2N7277R, 2N7277H	Radiation Hardened N-Channel Power MOSFETs (5 pages)
3229	2N7278D, 2N7278R, 2N7278H	Radiation Hardened N-Channel Power MOSFETs (4 pages)
3251	2N7279D, 2N7279R, 2N7279H	Radiation Hardened N-Channel Power MOSFETs (5 pages)
3252	2N7280D, 2N7280R, 2N7280H	Radiation Hardened N-Channel Power MOSFETs (5 pages)
3234	2N7281D, 2N7281R, 2N7281H	Radiation Hardened N-Channel Power MOSFTETs (4 pages)
3253	2N7282D, 2N7282R, 2N7282H	Radiation Hardened N-Channel Power MOSFETs (5 pages)
3220	2N7283D, 2N7283R, 2N7283H	Radiation Hardened N-Channel Power MOSFETs (4 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
3254	2N7284D, 2N7284R, 2N7284H	Radiation Hardened N-Channel Power MOSFETs (5 pages)
3225	2N7285D, 2N7285R, 2N7285H	Radiation Hardened N-Channel Power MOFETs (4 pages)
3255	2N7286D, 2N7286R, 2N7286H	Radiation Hardened N-Channel Power MOSFETs (5 pages)
3230	2N7287D, 2N7287R, 2N7287H	Radiation Hardened N-Channel Power MOSFETs (4 pages)
3256	2N7288D, 2N7288R, 2N7288H	Radiation Hardened N-Channel Power MOSFETs (5 pages)
3235	2N7289D, 2N7289R, 2N7289H	Radiation Hardened N-Channel Power MOSFETs (4 pages)
3257	2N7290D, 2N7290R, 2N7290H	Radiation Hardened N-Channel Power MOSFETs (5 pages)
3221	2N7291D, 2N7291R, 2N7291H	Radiation Hardened N-Channel Power MOSFETs (4 pages)
3215	2N7292D, 2N7292R, 2N7292H	Radiation Hardened N-Channel Power MOSFETs (4 pages)
3226	2N7293D, 2N7293R, 2N7293H	Radiation Hardened N-Channel Power MOSFETs (4 pages)
3227	2N7294D, 2N7294R, 2N7294H	Radiation Hardened N-Channel Power MOSFETs (4 pages)
3231	2N7295D, 2N7295R, 2N7295H	Radiation Hardened N-Channel Power MOSFETs (4 pages)
3232	2N7296D, 2N7296R, 2N7296H	Radiation Hardened N-Channel Power MOSFETs (4 pages)
3236	2N7297D, 2N7297R, 2N7297H	Radiation Hardened N-Channel Power MOSFETs (4 pages)
3237	2N7298D, 2N7298R, 2N7298H	Radiation Hardened N-Channel Power MOSFETs (4 pages)
3222	2N7299D, 2N7299R, 2N7299H	Radiation Hardened N-Channel Power MOSFETs (4 pages)
3258	2N7300D, 2N7300R, 2N7300H	Radiation Hardened N-Channel Power MOSFETs (5 pages)
3228	2N7301D, 2N7301R, 2N7301H	Radiation Hardened N-Channel Power MOSFETs (4 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
3259	2N7302D, 2N7302R, 2N7302H	Radiation Hardened N-Channel Power MOSFETs (4 pages)
3233	2N7303D, 2N7303R, 2N7303H	Radiation Hardened N-Channel Power MOSFETs (4 pages)
3260	2N7304D, 2N7304R, 2N7304H	Radiation Hardened N-Channel Power MOSFETs (5 pages)
3238	2N7305D, 2N7305R, 2N7305H	Radiation Hardened N-Channel Power MOSFETs (4 pages)
3261	2N7306D, 2N7306R, 2N7306H	Radiation Hardened N-Channel Power MOSFETs (5 pages)
3262	2N7307D, 2N7307R, 2N7307H	Radiation Hardened P-Channel Power MOSFETs (5 pages)
3239	2N7308D, 2N7308R, 2N7308H	Radiation Hardened P-Channel Power MOSFETs (4 pages)
3240	2N7309D, 2N7309R, 2N7309H	Radiation Hardened P-Channel Power MOSFETs (4 pages)
3263	2N7310D, 2N7310R, 2N7310H	Radiation Hardened P-Channel Power MOSFETs (5 pages)
3245	2N7311D, 2N7311R, 2N7311H	Radiation Hardened P-Channel Power MOSFETs (4 pages)
3246	2N7312D, 2N7312R, 2N7312H	Radiation Hardened P-Channel Power MOSFETs (4 pages)
3241	2N7316D, 2N7316R, 2N7316H	Radiation Hardened P-Channel Power MOSFETs (4 pages)
3264	2N7317D, 2N7317R, 2N7317H	Radiation Hardened P-Channel Power MOSFETs (5 pages)
3242	2N7318D, 2N7318R, 2N7318H	Radiation Hardened P-Channel Power MOSFETs (4 pages)
3265	2N7319D, 2N7319R, 2N7319H	Radiation Hardened P-Channel Power MOSFETs (5 pages)
3266	2N7322D, 2N7322R, 2N7322H	Radiation Hardened P-Channel Power MOSFETs (5 pages)
3243	2N7323D, 2N7323R, 2N7323H	Radiation Hardened P-Channel Power MOSFETs (4 pages)
3267	2N7324D, 2N7324R, 2N7324H	Radiation Hardened P-Channel Power MOSFETs (5 pages)

AnswerFAX DOCUMENT NUMBER	PART NUMBER	DESCRIPTION
3247	2N7325D, 2N7325R, 2N7325H	Radiation Hardened P-Channel Power MOSFETs (4 pages)
3244	2N7328D, 2N7328R, 2N7328H	Radiation Hardened P-Channel Power MOSFETs (4 pages)
3268	2N7329D, 2N7329R, 2N7329H	Radiation Hardened P-Channel Power MOSFETs (5 pages)
3248	2N7330D, 2N7330R, 2N7330H	Radiation Hardened P-Channel Power MOSFETs (4 pages)
3269	2N7331D, 2N7331R, 2N7331H	Radiation Hardened P-Channel Power MOSFETs (5 pages)
3563	ACS00MS	Radiation Hardened Quad 2-Input NAND Gate (8 pages) FN3563.1
3993	ACS08MS	Radiation Hardened Quad 2-Input NAND Gate (8 pages) FN3993
3630	ACS10MS	Radiation Hardened Triple Three-Input NAND Gate (8 pages) FN3630
3616	ACS20MS	Radiation Hardened Dual 4-Input NAND Gate (8 pages) FN3616
3995	ACS86MS	Radiation Hardened Quad 2-Input Exclusive OR Gate (8 pages) FN3995
3198	ACS245MS	Radiation Hardened Octal Non-Inverting Bidirectional Bus Transceiver (7 pages)
3999	ACS373MS	Radiation Hardened Octal Transparent Latch, Three-State (10 pages) FN3999
3997	ACS374MS	Radiation Hardened Octal D Flip-Flop, Three-State (10 pages) FN3997
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3188	ACTS245MS	Radiation Hardened Octal Non-Inverting Bidirectional Bus Transceiver (7 pages)
4000	ACTS373MS	Radiation Hardened Octal Transparent Latch, Three-State (10 pages) FN4000
3998	ACTS374MS	Radiation Hardened Octal D Flip-Flop, Three-State (10 pages) FN3998
3204	ACTS630MS	Radiation Hardened EDAC (Error Detection and Correction) (9 pages)
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3657	FRX234D, FRX234R, FRX234H	Radiation Hardened N-Channel Power MOSFETs (5 pages)
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2468	HCS245MS	Radiation Hardened Octal Bus Transceiver, Three-State, Non-Inverting (7 pages)
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2135	HCS373MS	Radiation Hardened Octal Transparent Latch, Three-State (8 pages)
2470	HCS374MS	Radiation Hardened Octal D-Type Flip-Flop, Three-State, Positive Edge Triggered (8 pages)
2105	HCTS240MS	Radiation Hardened Octal Buffer/ Line Driver, Three-State (7 pages)
2133	HCTS244MS	Radiation Hardened Octal Buffer/ Line Driver, Three-State (7 pages)

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3033	HS-6617RH	Radiation Hardened 2K x 8 CMOS PROM (13 pages)
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2794	HS-65643RH	Radiation Hardened 64K x 1 SOS CMOS Static RAM (11 pages)
2928	HS-65647RH	Radiation Hardened 8K x 8 SOS CMOS Static RAM (12 pages)
3991	HS-65758RHC	Radiation Hardened 32K x 8 CMOS Static RAM (9 pages)
3036	HS-80C85RH	Radiation Hardened 8-Bit CMOS Microprocessor (14 pages)
3035	HS-80C86RH	Radiation Hardened 16-Bit CMOS Microprocessor (21 pages)
3039	HS-81C55RH, HS-81C56RH	Radiation Hardened 256 x 8 CMOS RAM (16 pages)
3044	HS-82C85RH	Radiation Hardened CMOS Static Clock Controller/Generator (20 pages)

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3045	HS-83C55RH	Radiation Hardened 16K Bit CMOS ROM (12 pages)
3961	HS-RTX2010RH	Radiation Hardened Real Time Express™ Microcontroller (57 pages) FN3961or Call Harris Semiconductor (407) 724-7237 and request by mail.
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99011	AN9011	Synchronous Operation of Harris Rad Hard SOS 64K Asynchronous SRAMs (3 pages)
99106	AN9106	Special ESD Considerations for the HS-65643RH and HS-65647RH Radiation Hardened SOS SRAMs (2 pages)

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Printed in USA, 7/1995